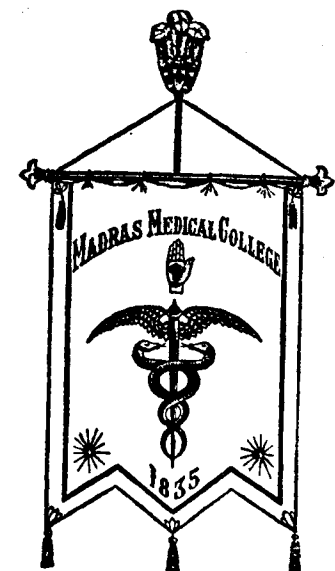


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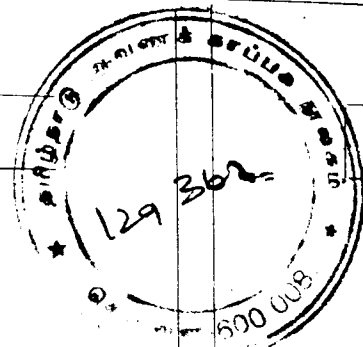
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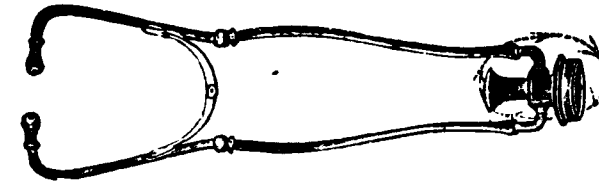
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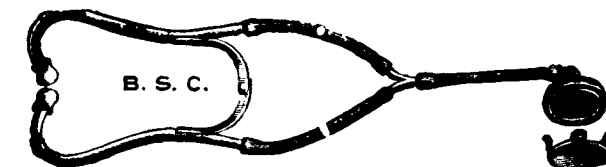
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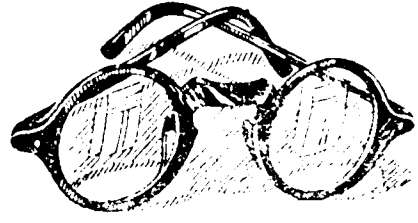
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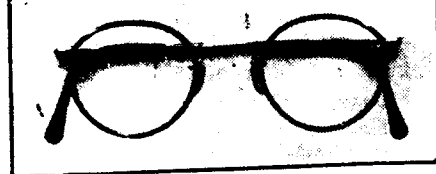
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Vol. XVIII, No. 2

JANUARY 1939.

THE MADRAS MEDICAL COLLEGE MAGAZINE

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The Madras Medical College Magazine.

Vol. XVIII.

January 1939.

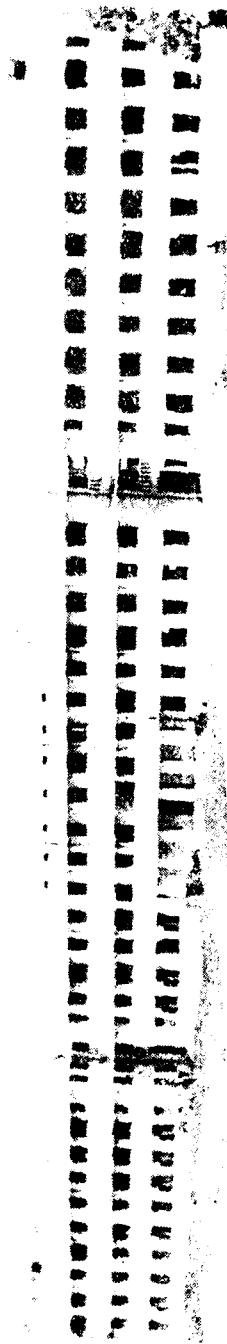
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No. 2.

Gastric Analysis.

BY D. NARAYANARAU, M.B.B.S.,

Professor of Biochemistry, Medical College.

General Considerations.

Gastric analysis is the usual means employed in the study of gastric function. It reveals the physiology of the organ by indicating the changes taking place in a testmeal and the manner in which the stomach responds to stimulation. This stimulation may be either artificial as in the case of histamine injection, and the administration of an alcohol meal or it may be natural when the testmeal consists of various articles of normal diet. The latter yield rather more accurate information concerning the motor activity and the gastric digestion than the former.

Types of Testmeal.

Several types of testmeal, such as Ewald's testmeal, Boas meal, Reigel meal, Ehrmann alcohol meal, histamine testmeal and fractional testmeal, have been used. Ewald's testmeal was in vogue till recently in most quarters. Now it is superseded by the fractional testmeal. It con-

sisted of washing down two slices of toast or bread with eight ounces of water or weak tea without cream or milk. An hour after, the stomach is emptied by means of a stomach tube. The contents were collected, measured, and examined for free HCl total acidity and chlorides.

The disadvantages of this form of testmeal are:—

(1) the pain during the removal of stomach contents by means of the stomach tube;

(2) the difficulty in removing the contents of the stomach completely owing to the big size of the tube and the obstruction of the bore by masses of bread;

(3) the absence of information regarding the condition of the resting juice, particularly as to its quantity, quality and the presence of pathological substances in it;

(4) the interference with the correct estimation of acidity and

volume of the stomach contents removed after one hour, by the varying quantity (20—120 c.c.) of resting juice of unknown acidity, more especially in cases of obstruction, when large volumes dilute the one-hour specimens.

Boas meal consists of about 400 c.c. of oatmeal. The advantage is that it is more easily removed, and allows the presence of lactic acid being more easily detected.

Reigel meal consisting of broth, broiled beef steak, and mashed potatoes resembles a normal meal and is useful in exciting the maximum secretory response. The acid values obtained by this method are higher than those of Ewald's meal.

Ehrmann's alcohol meal consisting of 50 c.c. of 7 per cent alcohol has the advantages of ready administration and easy withdrawals of samples, and the disadvantage of not being a natural food. It does not give any information about the motility of the stomach.

Histamine testmeal consists of subcutaneous injection of 0.01 mg. of histamine per kg. of body weight. It is used to differentiate true achylia from false achylia by urging the gastric mucosa to a maximal response. No information as to the motor activity of the stomach is however furnished by this method also.

The fractional testmeal introduced by Rehfuess is the one commonly in use now. It has superseded all other testmeals. It gives us an idea of the entire cycle of the digestion in the stomach. Practically it is a study of the gastric physiology.

Advantages of a fractional testmeal are:—

(1) the ease in swallowing and manipulation of the tube especially when a Ryle's tube is employed. Ryle's tube is a rubber tube of No. 8 size catheter-bore with a metal at one end covered by rubber; the only disadvantage being the smell of the rubber which is disliked by some;

(2) the definite information obtained regarding the volume and nature of the fluid in the stomach in the fasting condition (the interdigestive period) and the presence of mucus, bile, blood, strach and food residues of the previous meals;

(3) knowledge of the volume and nature of the meal;

(4) the extent of gastric response, indication of the rate and the amount of gastric secretion. The highest amount of acidity of the gastric cycle has been found to be at 1½ hours, and not at one hour. In Ewald's testmeal the highest acidity may not be reached;

(5) the easy aspiration of the meal except in a case of pyloric obstruction, where the rice particles of the previous night's food act as valves, thus preventing proper suction. A little air blown cautiously by means of a syringe will however remove the obstruction;

(6) the easy detection of the presence of pathological substances, such as mucus, pus, fresh blood, altered blood in the white gruel.

(7) the indication of the condition of the pylorus;

(a) with regard to the passage of gruel from the stomach to the duodenum (motility, emptying or evacuation time);

(b) with regard to the regurgitation of the duodenal contents into the stomach as evidenced by the presence of bile in stomach contents;

(8) the indication of the onset of pain at the specific point in the gastric cycle; I have actually witnessed in several cases of duodenal ulcers, patients actually groaning and writhing with pain holding their stomachs just about the time the sixth specimen is being taken. In these cases, I have seen them develop pain in about one-and-a-half hour after taking the meal; and

(9) the indication of the total period of the entire gastric cycle.

The study of gastric function by this gastric analysis has however also been subjected to the following criticisms:—

(1) the action of the tube acting as a foreign body in stomach. This action being very little is negligible;

(2) the stimulation of excessive saliva, tending to dilute and neutralise the free HCl. This is always prevented by asking the person not to swallow the saliva, but to spit it out into the receptacle provided;

(3) the inhibition of the gastric function owing to emotional upset during the test. Most people have no trouble on this account. In the hands of an experienced technician and with a little tact, no difficulty is felt. As a rule emotional strain is small and can be disregarded;

(4) the effect of duodenal regurgitation from retching. As a rule there is no regurgitation on this account when the test is done satisfactorily. If there is bile in plenty it is generally found that the tip of the tube has slipped into duodenum;

(5) the possibility of the existence of daily variations in the same subject. When an individual was subjected to a testmeal everyday for twenty days consecutively, it was found that the emptying time was constant in thirteen days and just slightly prolonged in five days and only in two days was it appreciably altered. The type of curve was found to be similar on all these days (Rehfuess);

(6) variations in the acidity at different levels of the stomach; the contents of the stomach are certainly not a homogeneous mixture. The function of the stomach is chymification, or making the meal into a homogeneous mixture. If the end of the tube is kept in one position, i.e., the lowest point of the stomach and kept there alone till the end of the testmeal, a serial view of the evolution of digestion at that part is obtained. Further the liquid employed in the testmeal helps easily the formation of homogeneous mixture. But if samples are taken at different levels by inexperienced nurses, by pulling on the tube frequently, figures and curves of peculiar shapes are obtained. There is a mark on the outside of the tube which acts as a guide and may be kept at the level of the incisor teeth constantly till the end of the testmeal.

Method of conducting a Fractional Testmeal.

The patient is to have a light supper the night before the examination. In England and other places

a charcoal biscuit also is given with the food to indicate the presence of any retention next morning. In the case of Indians rice particles play that role equally well. Presence of starch in the resting juice denotes retention.

The test is done in the morning without the patient having had anything since his last meal overnight.

The way to swallow the tube is described to the patient who is also encouraged by suggestions that it is a very easy task and that almost everybody does it with ease. He is asked to swallow the tip of the tube by placing it at the back of his throat just as he would swallow a pill. While in the act of swallowing he should neither bite the tube between his teeth nor try to push it in. In the former case there will be no progress and in the latter the tube curls and gets twisted at the back of the throat which is tickled, and causes vomiting. The nurse or the technician can just help by gently pushing the tube when the patient is swallowing it. A little glycerine rubbed over the tube helps in the swallowing of the tube. When ever the patient feels suffocated he is asked to stop swallowing and breathe through his nose rapidly. That will stop retching. There are two ring marks on the tube, one at 40 cm. and the other 57 cm. from the tip. When the first mark is at the incisor teeth the tip will reach the cardiac orifice. When the part of the tube between 55—57 cm. is at the level of the incisor teeth the tip is usually located in the lowest part of the stomach. The stomach is then emptied by means of a record syringe. No force whatsoever should be used. Many occult blood positives are due to powerful suction. If nothing comes, it is generally due to contraction of the stomach

wall on the end of the tube. Alteration of the position of the tube or pushing in a little air through the tube helps to overcome this difficulty. The stomach is completely emptied by altering the position of the patient, by making him lean forwards, backwards, or sideways. The stomach is empty when a peculiar noise "Burr Burr" is produced, when the piston of the syringe moves backwards or forwards. The open end of the tube is clamped. The testmeal is then given to the patient to drink. It consists of a pint or 600 c.c. of oatmeal gruel filtered through coarse muslin. Salt is not added if total chlorides are to be estimated. The stopclock is started and every fifteen minutes 10 to 15 c.c. of fluid are withdrawn by means of the syringe and put in a test tube marked in serial order. The specimens are withdrawn for 2½ hours or until the stomach is empty whichever is earlier. Two important precautions to be taken are :—

(1) the patient is told to spit out all saliva into the receptacle provided and not to swallow it on any account ; and

(2) the position of the tube should not be altered as all the specimens taken must be at about the same level.

The specimens are next filtered through coarse filter paper and examined for the presence of macroscopic pathological substances, such as excessive mucus, pus, fresh or altered dark blood (coffee grounds), bile and starch as tested by the blue colour obtained with iodine. They are chemically examined for their free Hcl and total acid content. One c.c. of the filtered juice is taken in wide test tube or a small titration flask and

Gastric Analysis

titrated against N/100 NaoH using Tœpfer's reagent (0.5 per cent alcoholic solution of dimethyl amino azobenzene) as an indicator. If free Hcl is present the indicator turns red. It is titrated to orange yellow colour. This reading denotes the free Hcl, when multiplied by 10 it gives the acidity equivalent to number of c.c. of N/10 NaoH per 100 c.c. of gastric contents. Then two drops of 1 per cent alcoholic solution of phenolphthalein are added and further titrated to pink colour. This reading denotes the total acidity. Multiplied by 10 it gives the total acidity equivalent to number of c.c. of N/10 NaoH per 100 c.c. of gastric contents. The percentage of free Hcl is got by multiplying the figure by 0.00365 and chlorine by 0.00355.

The usual emptying time of a gruel meal is 1½ to 2½ hours as determined by tests for starch with iodine. The numbers of c.c. of N/10 NaoH per cent are plotted against quarter hours. The points when joined give rise to a curve. The total chlorides and neutral chlorides are also estimated. The total chlorides curve will give us the real secretory curve and not the total acidity curve, owing to the effect of the regurgitation by alkaline duodenal contents. The total chlorides are estimated either by Whitehorn's, Maclean's or Van Slyke's method. Presence of free Hcl is detected by Gunzberg's reagent (phloroglucinol 2 g., vanillin 1 g., alcohol 30 c.c.). As the reagent does not keep well it is better prepared fresh each time by adding two Knife points of phloroglucinol and one of vanillin to two or three c.c. of absolute alcohol. Two drops of the reagent are mixed with four to five drops of juice in a china dish and gently heated over a flame, care being taken to prevent charring. Red colouration appears if free Hcl is present.

Interpretation of the Testmeal Findings.

The gastric contents are :—

(1) the resting juice or interdigestive juice, which indicates the interdigestive phase of gastric activity ; and

(2) the later specimens which indicate the digestive response.

The resting juice is found to vary markedly in normal people from 20 to 120 c.c. with an average of 54 c.c. It is clear and colourless in nearly 4½ per cent of cases and green in 57 per cent of cases, with no food particles. The average total acidity is about 30.0 in terms of cc. of N/10 NaoH per cent and free Hcl 18.5. Gastric mucus is present in traces while blood and pus are absent. So it is seen that the stomach is not empty but always contains some interdigestive juice. The green colour is due to bile and is found more often in cases of high acidity (over 30) than of low acidity. This seems to indicate that regurgitation of duodenal contents takes place to neutralise the high acidities. If the volume of the resting juice is more than 100 c.c., it is generally abnormal. The presence of food is also abnormal. If the total acidity is above 50 and free Hcl above 30, it is abnormal. Presence of marked increase in mucus, pus and blood is also abnormal.

If the residue is more than 100 c.c. without food retention, the condition is of a hypersecretory nature. In the absence of organic lesions, it may be the hypersecretion of psychic vagotonia or tobacco stimulation. It is frequently seen in cases of duodenal ulcers. It is less frequently seen in cases of chronic appendicitis and cholelithiasis.

A residue of more than 100 c.c. with food retention may sometimes be due to over-eating and over-drinking the night before (12 hours). This is rarely met with in a prepared testmeal case. It is more commonly seen in dilatation, in pyloric obstruction due to gastric carcinoma, gastric ulcer, duodenal ulcer, gastric syphilis affecting the tonus of the pylorus, tumours of the pylorus, hypertrophic pylorus, intragastric tumours and adhesions. Blood if due to trauma is diffuse and saneous looking. With Ryle's tube this is avoided although Rehfuß tube causes trauma on powerful suction. Blood from the gums, tonsils, nasopharynx and even from pulmonary hæmorrhages may be swallowed. Intragastric hæmorrhages are less common. Generally it is seen in juxta pyloric or chronic duodenal ulcers. It is seen very often in cancer of the stomach as coffee ground vomit.

Pus is derived mostly from swallowed nasal, postnasal or even pulmonary discharges, as, stomach is the drainage tank for nasal, postnasal and pharyngeal regions. It is generally extragastric, and intragastric only in cases of ulcerating carcinoma, gastric syphilis and infective gastritis.

The volume of fluid removed at the end of 2½ hours, also is important. It depends upon the efficiency of the gastric musculature and the condition of the pylorus. In normal people little or no fluid can be removed while in the pyloric obstruction and atony of the stomach large quantities (200 or more) are found.

The Gastric Digestive Response and its Variations.

The reduction of food into homogeneous chyme is the work of the stomach. The assessment of this work

is done by the examination of the work done by the mucous membrane and the musculature respectively. The work of the mucous membrane is essentially the formation of gastric juice, whose formation depends upon the state of mucous membrane, its nerve and blood supply.

The normal types of curves due to normal response are indicated in Chart I-A. Normal stomachs have been found to give varying curves and responses. The average of these types curves is taken as normal.

According to Rehfuß there are three types of normal responses: (1) Isosecretory 37 per cent, (2) Hypersecretory 33 per cent and (3) Hyposecretory 30 per cent.

(1) *Isosecretory type*.—In this even if free Hcl is not present in the resting juice, it appears soon in the first specimen and rises gradually reaching a maximum of 40 to 60 c.c. in 1 hour, 1½ hours and again falls gradually to 10 to 15 c.c. in 2½ hours. The difference between free Hcl and total acidity is about 9 to 10. Free Hcl is always present when total acidity is above 13.5 and is often absent when total acidity is below 10. Total acidity curve runs parallel to that of free Hcl.

(2) *Hypersecretory Type*.—Free Hcl is usually present in the residue, rising rapidly to a maximum of 70 to 90 c.c. in about 2 hours and declining thence rather slowly, secretory activity continuing in many cases even after the food has left the stomach.

(3) *Hyposecretory Type*.—Free Hcl is absent in the gastric residue and rises very slowly to a maximum of 30 to 40.

Gastric Analysis

What are generally shown as normal limits are an average of these three types (Chart I-B.)

Abnormal mucous membrane gives abnormal secretions, e.g., acute inflammation arrests the gastric secretion. Fortunately any affection small and localised rarely alters the gastric secretion unless owing to its proximity to the pyloric sphincter its proper action is impaired and the evacuation of the food is interfered with. Accordingly there is no characteristic alteration in the secretory response of the stomach in gastric ulceration until it approaches the pyloric sphincter or produces marked reflex nervous disturbances. On the other hand an ulcer in the duodenum produces characteristic changes owing to disturbance of the motor functions of the gastric musculature and the pyloric sphincter. It is well known that the gastric function is influenced by the vagus and sympathetic nerves through the local plexus of Auerbach and Meissner—the vagus being an excitatory while the sympathetic branches are inhibitory. The impaired gastric response in mentally depressed states and the arrest of gastric digestion during a state of shock or severe emotional excitement are brought about through this mechanism. The reflex alteration in gastric secretion accompanying the functional disturbances of the stomach and in diseases of other parts of abdomen, such as the gall bladder, appendix, intestines, etc., also points to the importance of the nervous mechanism in giving rise to the reflex type of curve characterised by low initial acidity—rapid response and hypermotility—the stomach emptying at the height of digestion (Chart II) The hormonal influence of the gastric secretion sometimes observed may also be dependent on this mechanism.

Besides the condition of the stomach and its innervation, the condition of the blood supplied to the organ also influences its secretion. The achylia of pernicious anæmia and the subacidity of secondary anæmias are traceable to this link in the chain of influences modifying gastric secretion.

Gastric secretion is also affected by duodenal regurgitation. Excessive regurgitation markedly alters the gastric response. In some cases the acidity is brought to such a low level as to suggest some defect in the mucous membrane. In these cases estimation of the total chlorides helps in obtaining the actual secretory curve. Lastly the rate of evacuation of food or motility is also an important factor in determining the nature of the gastric secretion.

Abnormal Responses Giving Rise to Abnormal Curves.

1. *Achlorhydria (Anacidity and Achylia Gastrica (Chart III)*. Achlorhydria denotes total lack of Hcl acid in the secretion, and achylia gastrica, not only a lack of Hcl but also an absence of combined acid and ferments as well in all the samples obtained during a gastric response. A reduction in the acid output may be due to (1) alterations in the mucous membrane, (2) nervous inhibition of the secretion and (3) alteration in the circulation.

The total acid in this condition is low and runs horizontal. True achylia can be differentiated from pseudo-achylia by the estimation of total chlorides. Histamine injection also helps in the differentiation. If an acidity is present even after histamine injection it is considered achylia gastrica. Achylia is most commonly observed in pernicious anæmia, gastric

carcinoma, (Chart VI) chronic gastritis, gastric neuroses, oral and nasal sepsis, subacute combined degeneration of the cord, and in severe secondary anemias.

The Hypoacid Response.—Curves lower than normal and sometimes even lower than the hyposecretory type of curve of normal response, may be due to (i) deficiency in the activity of the mucous membrane, (ii) excessive regurgitation from duodenum, (iii) relaxed pylorus, (iv) disturbance in the rate of evacuation of the secretion and (v) low response to certain foodstuffs. The mucous membrane is rendered functionally inefficient by inflammations, toxæmias, and infections. Large number of cases of gastritis are characterised by low acidity. Severe toxæmias, acute infections, chronic kidney disease, pellagra, gout, anaemia, Addison's disease and a good number of chronic gall bladder diseases, lessen the functional output of the mucous membrane. In most of these cases when the cause is removed the mucous membrane practically returns to normal function. Excessive duodenal regurgitation is indicated by the presence of bile in the specimens. In this case the efficiency of the mucous membrane is not affected. In instances of slow evacuation of the secretion, the low acidity will be further reduced by contact with the mucus.

3. *The Hyperacid Response.*—In this response we get acid curves above high normal levels. Rehfuess has classified the hyperacid curves into

(1) Larval hyperacidity characterised by sharp rise in the first hour and a normal curve later.

(2) Digestive hyperacidity or the normal hypersecretory type with

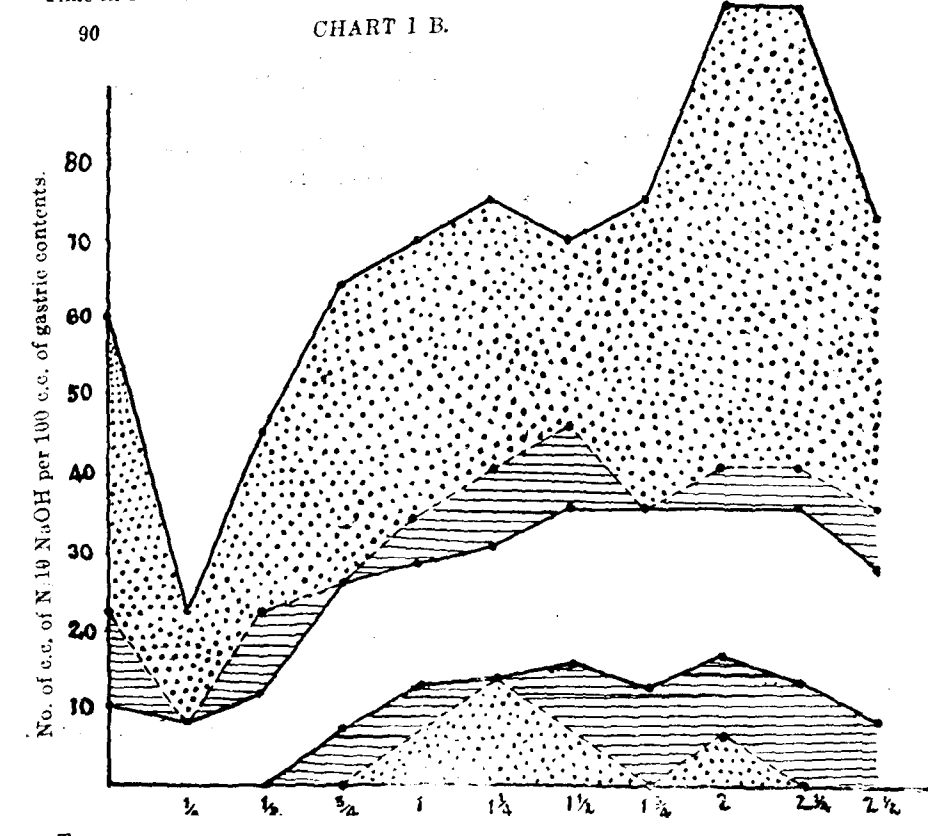
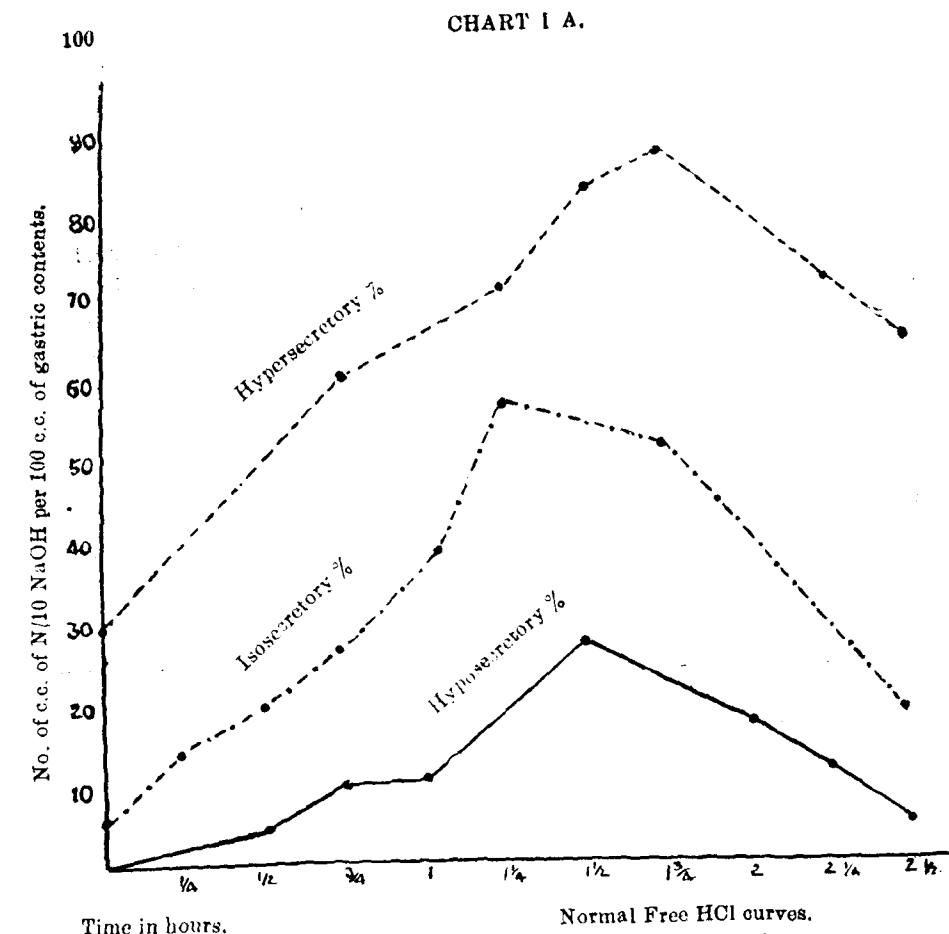
exaggerated and prolonged secretion—maximum acidity coincides with the height of digestive period.

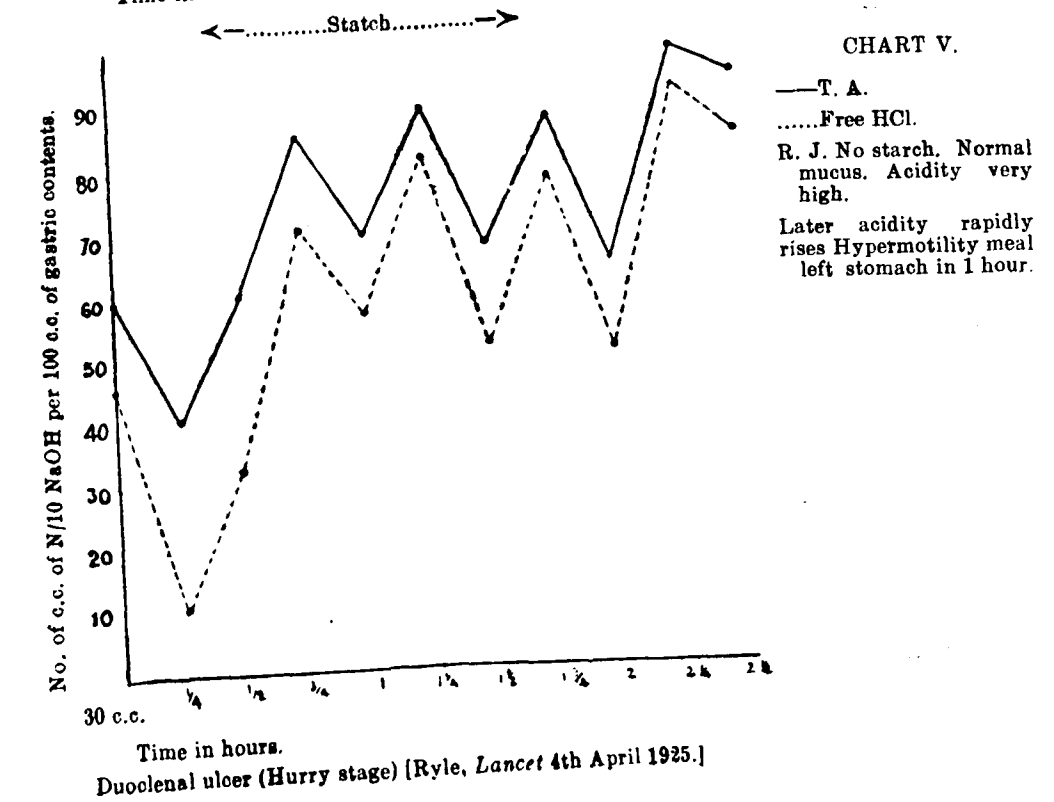
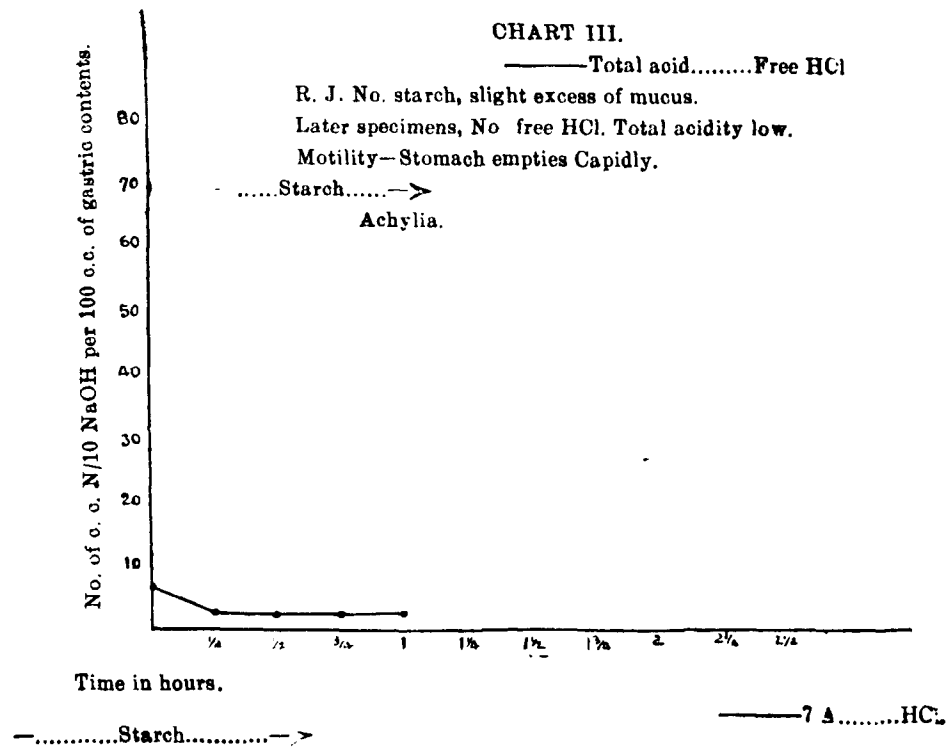
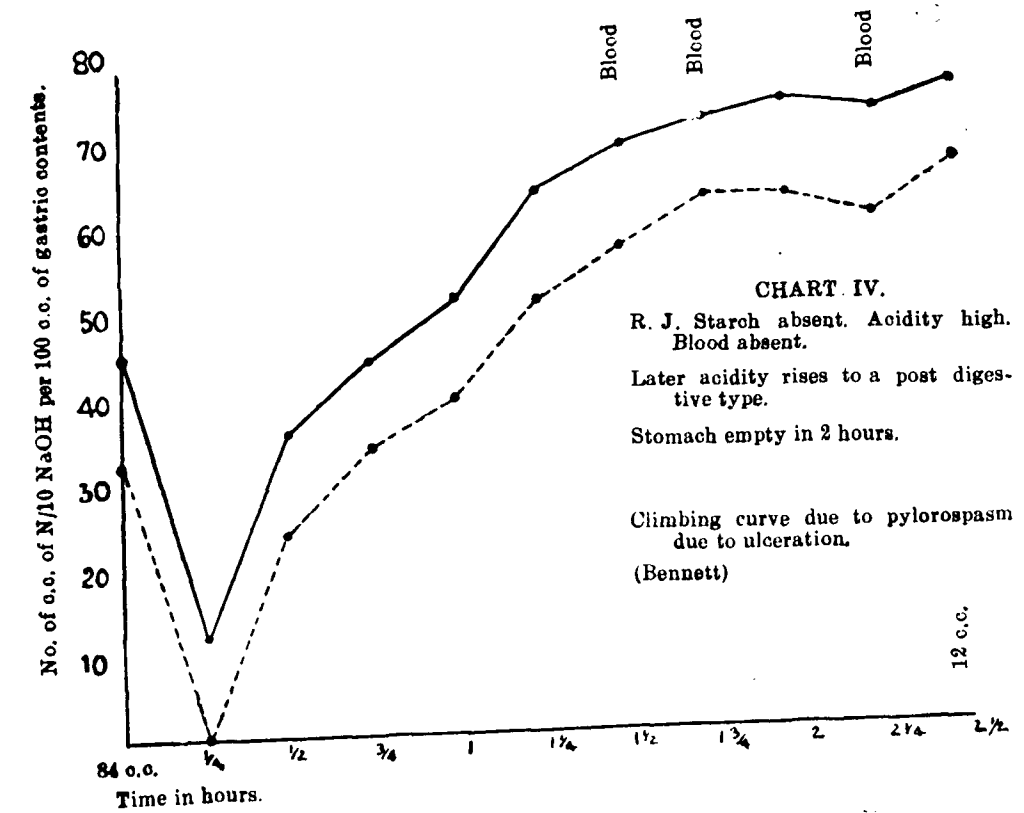
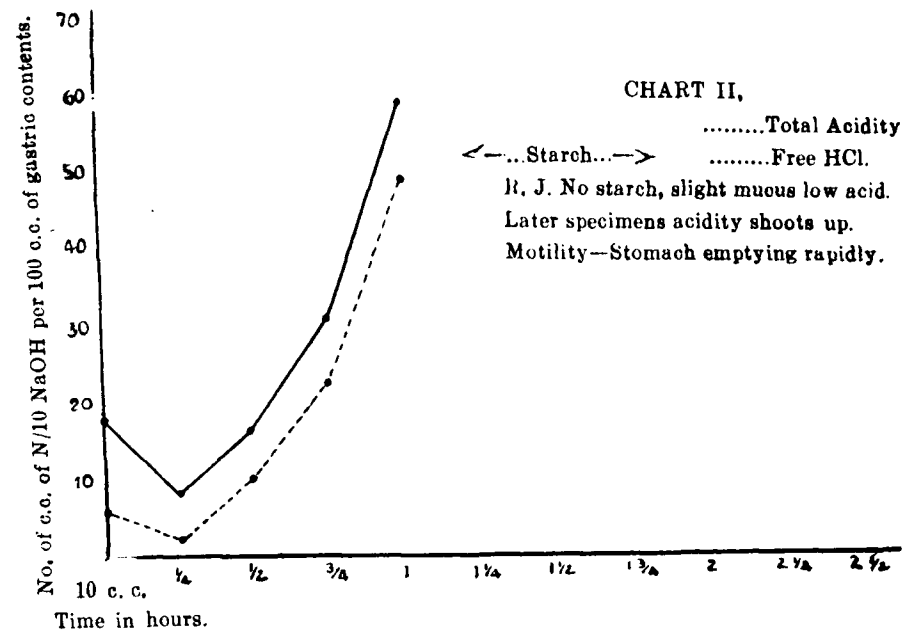
(3) The post digestive hyperacidity, in which the gastric acidity increases steadily reaching a maximum in the latter portion of the gastric cycle and is maintained during the interdigestive period (Chart IV).

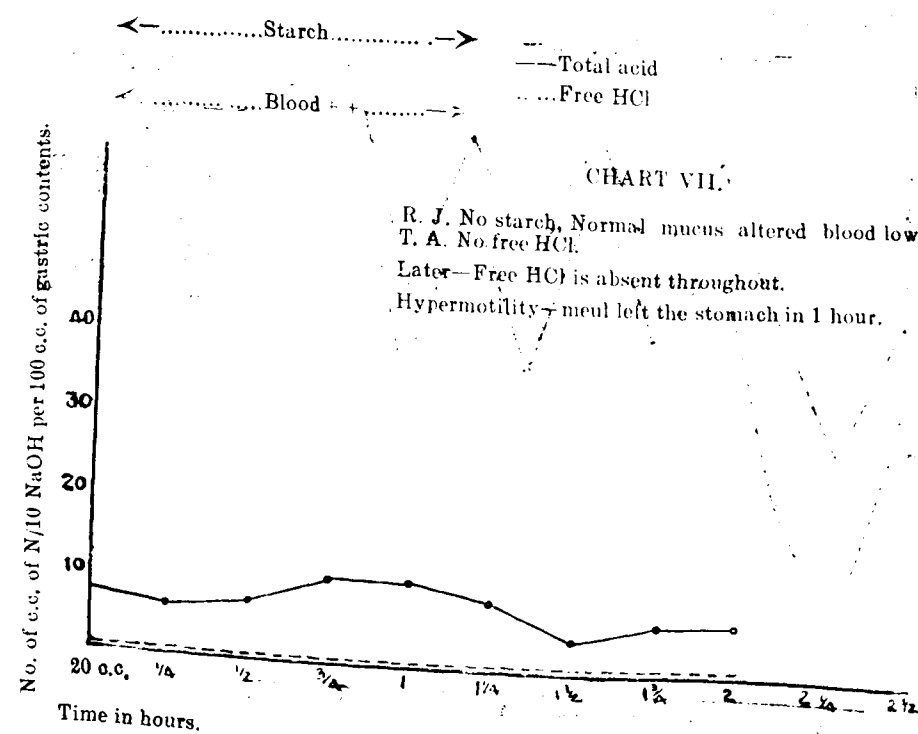
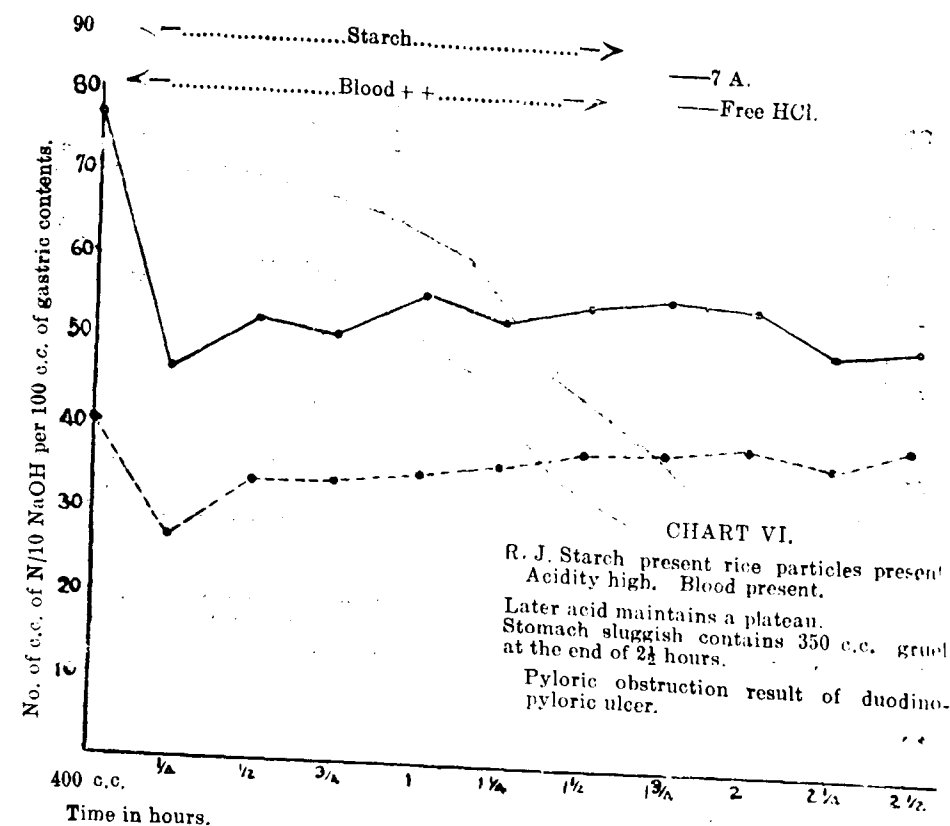
(4) *Interdigestive hyperacidity.*—This type of response is merely seen as a prolongation of the post digestive type of hyperacidity and is due to over stimulation of the nervous mechanism by emotional tonic (chemical or bacterial); or endocrine substances. The mucous membrane is stimulated through the nervous or circulatory mechanism resulting in an excessive secretion by the acid cells of the mucous membrane as an overfunction.

Defective regurgitation as a result of pyloric hypertension due to the ulcers nearby causes pathological hyperacidity. The larval type is generally seen in nervous cases. The post digestive hyperacid type is found in 70 to 80 per cent of duodenal ulcers and in many instances of cholecystitis and chronic appendicitis. The interdigestive hyperacidity type of curve is frequently observed in patients with duodenal ulcer, chronic cholecystitis and duodenal adhesions. But it may be obtained also in neuroses and in people who use tobacco in excess.

(5) Another type of hyperacidity is seen in cases of marked pyloric stenosis. The rise in acidity persists over hours. The stomach is unable to mechanically evacuate its food. The digestive period is prolonged at the expense of interdigestive period. The type of curve produced is called a "plateau curve".







Gastric Motility and its Variations.

Motility is an expression of the condition of musculature of the gastric walls and sphincter. The power of the musculature depends not only upon the tone of the plain muscle fibres but also on the nervous mechanism underlying it. Increased tonus of the gastric musculature is compensated by the increased tone of the pylorus which holds up food which otherwise would be evacuated too rapidly. Thus gastric evacuation does not depend merely on the gastric peristalsis but also on the efficiency of the pyloric sphincter.

Hence *Hypermotility* or premature evacuation of food is not only caused by hyperperistalsis but is also caused by a relaxed condition of the pylorus even in the presence of lessened peristalsis. The want of tone is probably due to the same cause which lessens the mucosal tone. This form of hypermotility is found in all cases of sub-acidities and anacidities, chronic gastritis and anæmia. Hypermotility may also be due to a patent pylorus as in diffuse scirrhus carcinoma of the pylorus. Hyperperistalsis results in premature evacuation. Functional form of this disorder is called by the French authors "gastric chorea". Organic form of the same is seen characteristically in a small group of duodenal ulcers (Hurrystage). This type of hypertonus is characteristic (Chart V). Hypermotility is also seen after gastroenterostomies especially when the patent stoma is large.

Hypomotility or Delay in Evacuation.

The factors that bring about this condition are:—

(i) weakness of the gastric musculature, as in atony of the stomach or atonic dilatation; and

(ii) delay in evacuation caused by hypertonicity of the pylorus, as is found in reflex conditions such as chronic infections of the gall bladder, pancreas, duodenum, intestine and appendix or organic obstruction. In this group of cases the delay may be for a short period or longer as in organic obstruction.

The delay is most characteristic in cases of an obstruction at or near the pylorus. The obstruction may be due to intragastric causes as in the case of pyloroplasm, cicatrising ulcer, carcinoma, hypertrophic pylorus or growths at the pylorus. In the case of spasm the obstruction is intermittent, while in the case of cicatrising ulcer or stenosis, carcinoma of the pylorus or antrum, it is persistent, giving rise to a characteristic type of "plateau curve". The acidity may fall immediately after the ingestion of the meal (Chart VI) due to dilution of the gastric juice. This preliminary fall is followed by a sharp rise, the acidity being maintained for several hours. A plateau curve is characteristic of pyloric stenosis of an advanced degree, combined with an active gastric secretory activity (stenosing peptic ulcer).

After having examined the gastric secretion and musculature, it is essential to search for the presence of pathological substances:—

(1) Mucus is present normally in traces, and pathologically in great amounts in chronic irritation of the superficial layers of the mucous membrane as in chronic gastritis.

(2) Pus signifies inflammation with superadded infection. This has to be distinguished from the pus swallowed from the nose or nasopharynx. When the patient has not swallowed

saliva, it means generally infection—a phlegmonous gastritis, syphilis or cancer.

(3) Blood in the digestive phase is due to congestion, erosion, or ulceration of the mucous membrane. It must be carefully differentiated from that swallowed from gums, pharynx, etc. "Coffee ground" digested blood is found in the cancer of the stomach or big juxtagastric ulcers.

(4) Bile is an evidence of duodenal regurgitation.

(5) Other fermentative chemical changes occur whenever there is stagnation. Butyric acid and lactic acid are produced giving rise to foul odour.

Summary.

The gastric function can best be studied by fractional testmeal. The

gastric cycle—digestive and inter-digestive phases—is well observed by this test. Naked eye examination of the specimens of gruel withdrawn is as important as chemical findings. Several findings have to be correlated before a diagnosis of the disease is arrived.

REFERENCES.

Beaumont and Dodds.—"Recent Advances in Medicine."

Bennett, T. I.—"Stomach and Upper Alimentary Tract."

Hawk and Bergcim.—"Practical Physiological Chemistry."

Hugh Maclean.—"Modern Views on Digestion."

Martin Rehfs, E.—"Diseases of the stomach."

Ryle, J. A.—"Gastric Function in Health and disease."

Trumper, M. and Cantarero, A.—"Biochemistry in Internal Medicine."

Chemotherapy of Bacterial Infection.

SULPHONAMIDE AND DERIVATIVES—A REVIEW.

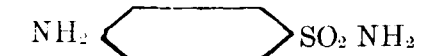
BY J. C. DAVID, M.B., Ph.D.,

Madras Medical College.

In 1935 Domagk first published his results of the clinical trials of *Prontosil* in streptococcal infections. This is the hydrochloride of 4-sulphanilamido-2:4-diamino-azo-benzene, and is entirely non-toxic and has no physiological effect on circulation or unstriated muscle, etc. But, mice inoculated with 10 M.L.D. of *Streptococcus pyogenes* survived if from 1/10 to 1/50 of the maximum tolerated dose were given repeatedly either by mouth or by injection. This action has been confirmed in man. But *Prontosil* is entirely without action on bacteria *in vitro* and its mode of action was a complete mystery until the hypothesis, now generally accepted, was put forward that its action was due to conversion to sulphanilamide or *p*-amino benzene sulphonamide in the body. Sulphanilamide is found in urine when *Prontosil* is given by mouth and a greater part of this substance is reduced in this manner in the presence of infection.

A number of such compounds are now in use and synonyms under which these are sold have led to much confusion.

Sulphanilamide consists of a benzene-sulphonamide with an amino group in the para position; activity is removed if the amino group is transferred to the ortho or meta positions.

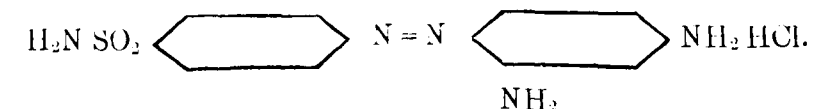


This is also called *Streptocide* or *Prontosil album*, *Prontylin*, *Colsulanyde*, etc., and may be given by mouth, subcutaneously and intrathecally (0.8 per cent aqueous solution represents limit of solubility).

Other compounds which have excited interest or have been found worthy of clinical trial fall approximately into three groups:—

(1) Those in which substitution has been made in the amino groups: Sulphamido-chrysoidin. *Prontosil* soluble, Benzyl-amino benzene sulphonamide (*Proseptasine*) and *Soluseptasine*.

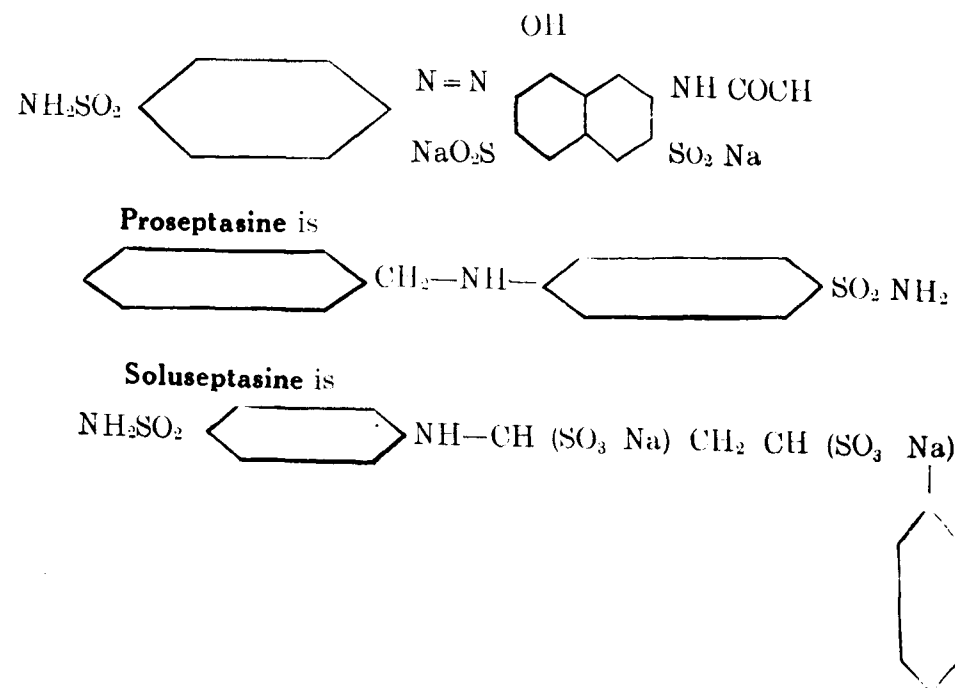
Prontosil also called **Prontosil rubrum** or sulphamide chrysoidin, is an azo-derivative containing two benzene rings and is meant for oral administration only:



Soluble Prontosil is the disodium salt of 4' sulphonamido-phenyl-azo-1-oxo-2:7-acetylaminonaphthalin—3:6

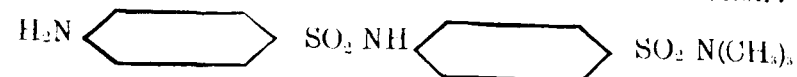
di-sulphurous acid and is represented thus:

(See the next page.)



(2) Those in which one hydrogen atom of the sulphanido group has been substituted, *Uleron* and *M. & B. 693*.

Uleron *Disseptal* has the following chemical construction:



M. & B. 693 is 2 (*p*-amino benzene sulphonamide)-pyridine, also called 2-sulphanilyl-amino-pyridine.

(3) Compounds of sulphone type which are chemically unrelated to the sulphonamides: 4-4' *acetamido diphenyl sulphone*, etc.

The last group indicates that the sulphonamide group is not the only chemical structure which is effective in bacterial infections—thus supporting Domagk's theory (later referred to) that the activity of *prontosil* is not entirely due to its reduction to sulphanilamide in the body. Indeed, 100 c.cm. of 2.5 per cent *prontosil* yields only 0.7 g. of sulphanilamide; hence, weight for

weight *prontosil* is more active than sulphanilamide.

A survey of the three groups of compounds establishes certain facts. In the first group in which sulphanilamide may be included, the range of activity is nearly the same; there is activity against haemolytic streptococci, meningococci and gonococci, but little effect on the pneumococcus with the exception of Type III which is itself virtually a streptococcus.

If the sulphonamide groups are multiplied the activity is extinguished.

In the second group the range of activity in most has been increased to

include at least pneumococcus and the effect against other bacteria affected by the first group is equal if not greater. *M. & B. 693* is outstanding in this group. If the amino group is also substituted this pyridine compound loses much of its activity.

Although the range of activity is increased with regard to the sulphones they are too toxic for clinical trial.

Absorption and Excretion of Sulphanilamide.—Sulphanilamide is rapidly absorbed from the gut, the process being completed in four hours. It enters the blood at the same rate if given subcutaneously. Reaching a peak in about three hours, the concentration falls in a straight line to almost zero in 24 hours; thus a fully adequate concentration for therapeutic action persists after any single dose for about six hours. Four or six-hourly administration will therefore maintain this. Other theoretically effective substances like acridine dyes are excreted too rapidly. This persistence in the blood is due to the reabsorption (Marshall *et al*) in the renal tubules of 70 to 80 per cent of the drug in the glomerular filtrate. The rate of clearance increases with the rate of urine flow; and so the drug can, at will, be washed out of the system by forced fluids and consequent diuresis; hence the importance of restricting intake of fluids. Sulphanilamide is not concentrated in any particular organ. It has been demonstrated in pleural and peritoneal effusions and in the spinal fluid. If the drug is given in divided doses over a period of time, equilibrium between absorption and excretion takes about three days to be established, and about the same time elapses after cessation of treatment before elimination is completed. Practically all the drug given can be recovered from the

urine, excretion being delayed when the kidneys happen to be previously damaged. *Prontosil* is excreted in urine partly unchanged and partly as sulphanilamide, some of which is conjugated to form *p*-acetyl-amino-benzene-sulphonamide.

The precipitation of excreted sulphanilamide in urine at room temperature has been demonstrated (Stewart, Rourke and Allen, 1938), suggesting the possibility of formation of stones in the urinary tract, should urine volume become too small during sulphanilamide therapy.

M. & B. 693 is only soluble to the extent of 1 in 1,000 but, despite its relative insolubility, the drug is rapidly absorbed, even more rapidly than sulphonamide, and it is excreted in about equal proportions of free drug and conjugated acetylated form.

Sulphanilamide has been found in the cervical secretion and menstrual fluid but in amounts too small for any bactericidal action. It is also excreted in breast milk, both free and as the acyl derivative. It is transmitted to the placenta and foetus. Until more is known of the tolerance of human foetus and of the new born for sulphanilamide, the drug should be administered only with the utmost caution during pregnancy and lactation (Adair *et al* 1938).

Anti-bacterial Action.—It is perhaps necessary to point out that the use of these drugs imperatively demands a bacteriological as well as a clinical diagnosis. These are *specifics* not for septicæmia, meningitis, or pneumonia, but for infections by certain bacteria wherever situated and have little or no effect on other species.

Prontosil has no action on bacteria *in vitro*, but its reduction product sulphanilamide was found to delay the growth of a small inoculum of *streptococcus haemolyticus* (30 to 50 cocci) at a dilution of 1 in 10,000 for two or three days. But even at a strength of 1 per cent it was not able to affect the growth of a huge inoculation of 300,000,000 organisms, but it was able to slow down the rate of multiplication of an inoculum to 1/10 that number. Also, sulphanilamide in a dilution of from 1 in 13,000 to 1 in 18,000 in human blood could completely, or almost completely, destroy an inoculum of 3,500 cocci per 5 c.mm. On the other hand, *prontosil* had no action under similar conditions.

Animals were given sulphanilamide and *prontosil* by mouth. It was then found that small inocula of streptococci were destroyed by the blood under these conditions. Similarly in normal persons and those infected with streptococci, the administration of large doses of *prontosil*, *prontosil S.* or sulphanilamide increased the bactericidal power of the blood.

From the observation that neither *prontosil* nor *prontosil S.* when added to blood can check the growth of organisms while internal administration of either drug to man or animal confers that power on it, it is deduced that both can give rise to sulphanilamide in the body, as has been shown by direct experiment; and that sulphanilamide has a direct damaging action on streptococci; either actually killing them or at least preventing their growth; the limited numbers upon which the drug acts *in vitro* correspond to those found in the blood stream and elsewhere in widespread infection.

Fleming (1938) found that the anti-bacterial power of *M. & B. 693*

resides in the serum and that the efficacy of leucocytes was not increased. The patient's serum not only inhibits the growth but also inhibits the production by *S. pyogenes* and pneumococcus of substances which alter the blood. When added to human blood or contained in the blood of patients taking the chemical it does not prevent encapsulation of pneumococci but a more likely of action is simple inhibition of growth (and possibly of toxin production) and the decapsulation occurs as the result of some other autolytic process.

Fritz Meyer (1938) believes that sulphanilamide acts only in organisms which possess a certain amount of natural resistance. He observes that cases of severe streptococcal infection, as for instance, puerperal fever, which do not respond to sulphanilamide may be cured by additional treatment with anti-streptococcal serum. In as much as the chemotherapeutic agent can only exert its action under co-operation of the natural defence system of the infected organism, this resistance must be supported by all possible means (*immune* transfusions, vitamins, etc.). The toxic by-effects of the drug can be avoided by combining serum and sulphanilamide as this combination makes the reduction of the sulphanilamide dosage below the point of danger possible. Fleming (1938) is also of opinion that the actual destruction of the organisms is effected by the natural defences of the body, although these may be unable to function successfully unless the growth of the bacteria has been restrained by the chemical. A patient infected with a very sensitive haemolytic streptococcus is likely to be saved even when the natural immunity is low. If, however, this patient is infected with a less sensitive microbe, such as a particular type of

pneumococcus, then the serum of such a patient is almost impotent in the presence of his own leucocytes, although when healthy leucocytes are present, and growth is completely restrained. In the case of an infection with this microbe, therefore, it is unlikely that a drug like *M. & B. 693* would be effective unless the natural defensive mechanism of the body was in good condition.

Maegraith and Vellum (1938) examined the bacteriostatic effects of sulphonamide, soluseptasine and *M. & B. 693*. All three drugs inhibit the growth of *Streptococcus viridans* at a dilution of 1 in 2,000 in the presence of defibrinated human blood. *M. & B. 693* doing so at a dilution as high as 1 in 10,000. None of these drugs is effective in the absence of leucocytes. None of these drugs exhibit any bacteriostatic effect on *staph. aureus*. The growth of gonococcus is retarded by all three drugs in the presence of leucocytes. In de-leucocytized blood soluseptasine still exerts a strong bacteriostatic effect on the organism. All the drugs are effective against meningococcus in the presence of the corpuscles—in the case of *M. & B. 693* at a dilution of 1 in 60,000. That drug is active at a dilution of 1 in 60,000 even in the absence of blood. The despondence of these drugs on the presence of leucocytes is in agreement with the findings of Fleming, quoted above.

Some authorities as mentioned earlier, are not yet completely convinced that the action of *prontosil*, etc., is solely due to the liberation of sulphanilamide *in vivo*. One objection is that weight for weight *prontosil* is therapeutically the more effective; the amount of sulphanilamide which it liberates is distinctly less than the amount of sulphanilamide itself which

has to be given to achieve the same results. Another point is that other therapeutically active compounds such as *uleron* are not reduced to sulphanilamide in the body. Thirdly, while *prontosil* was found to be efficacious in curing mice infected with the *virus* of choroid meningitis, sulphanilamide had no such effect.

There are other discrepancies which have not yet been explained. Thus, *prontosil* is active *in vivo* but not *in vitro*, whereas sulphanilamide is active against pneumococcus *in vitro* but not *in vivo*. Whitby found that with *M. & B. 693* this lack of parallelism is still more evident. Mice which receive a dose of 2 mg. of *M. & B. 693* have a blood concentration sufficient to enable the shed blood to kill pneumococci *in vitro* yet a dose of 30 to 40 mg. is necessary to save life; on the other hand, this small 2 mg. dose will save the life of mice infected with streptococci, but the shed blood is quite inactive against the organism *in vitro*.

The question as to how exactly the death of the micro-organism is brought about has been a subject matter for much research and conjecture. It was early noted that sulphanilamide had more action on streptococcal capsules and this has now been confirmed in the case of pneumococcus by *M. & B. 693*. Inhibition of toxin production has been suggested. Sulphanilamide will differentiate between the serological grouping of a single organism such as B-haemolytic streptococcus and this astounding example of specificity has led workers to enquire into its relationship to immune body production and specific antibodies.

These drugs are not leucocytic stimulants. Animals which are going to die of pneumococcal infection have

always leucopenia. Those which survive have an almost normal count, not a leucocytosis. From this it seems to follow that by inhibiting bacterial multiplication, the drug not only prevents toxic depression of the marrow from a serious infection but also leaves the marrow unstimulated. Experiments done so far seem to confirm the idea that these drugs are not specifically concerned with the immunity mechanism and therefore it is wise to press into service all those devices for producing specific immunity which have been the great support of medical treatment. But it may be stated that the immunity created in animals cured of a living infection by a drug like M. & B. 693 has been found by Whitby (1938) to be fundamentally the same both in *quantity*, *quality* and *speed of production* as the immunity created by orthodox active immunisation.

Another interesting finding by Whitby is regarding the 'lag' phenomenon noticed *in vitro* and *in vivo*. In animals receiving M. & B. 693 prophylactically so that they have a high blood content of the drug at the time bacterial inoculation is made, bacterial multiplication occurs for some time though the infection is choked within 24 hours. The same phenomenon is observed in *in vitro* experiments. This delayed action may be due to the fact that the drug is not a direct protoplasmic poison but that some multiplication of bacteria occurs until after adsorption of sufficient drug multiplication is rendered more and more difficult and eventually ceases. It may be that death is brought about by inanition or because of the lack of assimilation of some factor essential to bacterial reproduction. It may be that by some loose combination with the bacterium, perhaps in some such way

as Ehrlich originally visualised interference with the essential functions of the bacterial cell occurs leading to death.

There is a hint at present of the possibility of the development of resistant strains of bacteria. Whitby found that M. & B. 693 became progressively more inactive on *Streptococcus viridans*. It suggests that if the first course of the drug is not completely successful it might be as well to use a different drug for a second course.

Therapeutic Action.

(1) IN STREPTOCOCCAL INFECTIONS.—It is important to recognise that susceptible infections are only those due to *Streptococcus pyogenes*; those due to *S. viridans*, such as subacute bacterial endocarditis (in the case of sulphanilamide) and to *S. faecalis* (urinary infection due to the organism) are uninfluenced.

In *Erysipelas* uniformly good effects are secured. Prontosil has been found to arrest the spread forthwith. Fever abates within 24 hours. Snodgrass, Anderson and Rennie (1938) are of the opinion that the choice of the drug to be employed can be left to individual preference. The method of administration to an adult patient is recommended to be: (i) Sulphamido chrysoidin (Prontosil) 1.5 g. every 4 hours, *i.e.*, 9 g. per day, until cure is established; thereafter 1 g. *t. d. s.* for a further period of 14 days; (ii) Sulphanilamide 1 g. every 4 hours, *i.e.*, 6 g. a day until cure is established; thereafter 1 g. 3 times a day for a further period of 14 days. All other drugs must be avoided during the period of specific treatment, a list of suitable purgatives should be given to the patient, the use of enematae

explained and explicit instructions given regarding diet.

In *Tonsillitis and Scarlet Fever* favourable reports have been made, the streptococcus disappearing from the throat very quickly.

In *Puerperal Fever* the mortality has been very greatly reduced. The effect of prontosil in severe cases is said to be superior slightly to that of sulphanilamide.

Horan and Gay French (1938) found sulphanilamide given on admission to cases of acute suppurative otitis media and continued for a few days, inhibiting the course of the disease. The incidence of mastoiditis was very greatly reduced. The infection was mostly streptococcal.

P. C. Bucy (1938) cites an interesting case where owing to an error in diagnosis a right cerebellar abscess was exposed with a bilateral suboccipital craniotomy. The contents of the abscess were aspirated and the surface of the cerebellum was contaminated with pus swarming with hæmolytic streptococci, thus exposing the ventricular system and the subarachnoid space to this infection. The abscess was not drained. Sulphanilamide was started at once. The patient improved steadily. There was no febrile reaction and neither meningitis nor refilling of the abscess did occur. In two weeks the patient had almost completely recovered.

Sulphanilamide is the drug commonly used against streptococcal infections. M. & B. 693 is as active as, if not more so than sulphanilamide against *streptococcus hæmolyticus*. M. & B. 693 has been tried in subacute bacterial endocarditis caused by *streptococcus viridans*.

proved by blood culture. Clinical improvement occurred even where the case was not expected to survive but in subsequent courses the effect became less and less beneficial—a fact noted earlier in this paper.

Proseptasine is equally active against streptococcal infections. Clinically the drug is effective in erysipelas, streptococcal tonsillitis, etc. The compound has not been completely studied biochemically but it is known that its action does not depend on reduction to sulphanilamide. It is much less soluble than sulphanilamide and is safer. While sulphanilamide is to be preferred in urgent cases, the benzyl compound is more useful in milder cases. *Soluseptasine* is not only soluble but is completely nontoxic. This latter substance is reduced in the body to sulphanilamide. *Prontosil* is not much used now as all its effects can be obtained by the more soluble sulphanilamide. The soluble prontosil may come in useful where immediate results are required or where oral administration is inconvenient.

As regards the dose of sulphanilamide most authors agree that a large initial dose is desirable (3 to 5 g. or more of sulphanilamide) in order to attain an adequate blood level as soon as possible. Long and Bliss suggest as a rule for total daily dosage 1 g. of sulphanilamide per 20 lb. body weight (maximum 5 g.) and 1 c.c. prontosil soluble (2.5 per cent solution) per 1 lb. (maximum 120 c.c.). Daily doses of about 5 g. can produce a maximum blood concentration of 5 to 7 mg. per 100 c.cm. and this is considered satisfactory in mild and moderate infections. These doses have often been exceeded. Much higher doses (12 g. daily) have been used. Children require proportionately larger doses. In less severe infections such large

doses may not be necessary but it is safer to err on the side of giving too much rather too little, as the toxic symptoms caused by 4 g. doses are slight and not alarming. The drug should not be stopped too soon as recurrence of infection may follow.

(2) IN PNEUMOCOCCAL INFECTIONS.—*In vitro* and *in vivo* experiments on animals have shown that pneumococcus is also susceptible to sulphanilamide. It seems clear that type III infections are more amenable to the treatment than others, a singular fact all the more fortunate since this type is entirely uninfluenced by serum. It has already been pointed out that this type is virtually a streptococcus.

M. & B. 693 is highly active against pneumococcus of several types. In pneumococcal pneumonia and pneumococcal meningitis its effects are dramatic. In a series of 100 pneumonia patients no more toxic effects were noticed than cyanosis, nausea and occasionally vomiting. This last is unfortunate, since M. & B. 693 is soluble only to the extent of 1 in 1,000 and is only available for oral administration. Vomiting is due to local irritation of a sensitive stomach. Some patients take the drug better when it is powdered and suspended in milk, some when it is powdered and given in cachets and some when sodium bicarbonate or some gastric sedative is given along with it. It may, in the last resort, be given as an injection in olive oil of 0.5 g. in 2.5 c.c. As to dosage the best plan is to give a relatively high initial dose followed by a sufficient regular four-hourly dose to maintain the blood level at an adequate concentration. Whitby recommends 5 g. in first 12 hours, followed by 1 g. four-hourly making a total of 23 g. in a week. This keeps

the blood concentration at about 8 mg. per 100 c.c. in the first 12 hours and this is maintained throughout treatment. The blood contains no drug 24 hours after withdrawal but the urine contains it for some 48 hours. It has already been pointed out that despite its relative insolubility, the drug is rapidly absorbed even more rapidly than sulphanilamide and is excreted more slowly.

Dyke (1938) reports a case of pneumococcal septicaemia successfully treated with M. & B. 693. The septicaemia was subdued after the first 9 g. Reid and Dyke (1938) report recovery in a case of pneumococcal meningitis in a girl of 7. Within 12 hours of starting treatment the pulse, respiration and temperature fell rapidly. But progress was slow. A total dosage of 15 tablets or 22.5 g. in 10 days was required to cure this case.

(3) IN MENINGOCOCCAL INFECTION there is clear evidence of therapeutic efficacy. In meningococcal meningitis sulphanilamide has been found effective in both group 1 and group 2 infections. Chemical studies show that either oral administration or subcutaneous injection causes it rapidly to reach the spinal fluid of normal subjects and those with inflamed meninges. Early treatment is essential and the concentration of the drug in the cerebro spinal fluid should be maintained at 5 mg. per 100 c.c.m. Protosil and protosils soluble have not got the same penetrability into the spinal fluid.

There is as yet no agreement as to the best method of administration. Oral, subcutaneous and intrathecal methods have been tried. Oral administration is sufficient in most cases. The intrathecal route need only be

used for a preliminary injection and when adequate concentration cannot be kept up by other means. Clinical evidence is in favour of combining intravenous or intraperitoneal serum therapy with the drug in several cases.

Proseptasine is experimentally inactive against meningococcus but clinically it has given good results.

M. & B. 693 has also been used with success in a few cases of meningococcal septicaemia.

(4) IN GONOCOCCAL INFECTION.—Reports vary. While almost all authors report good results, a minority of patients entirely fail to respond. O'Hanlan's statement that the average period of invalidity among troops at Altershot has been reduced from 62 to 21 days carries conviction. Treatment should be begun in the acute stage. Complications, both local and metastatic respond well and the rapid disappearance of gonococci from exudates in distant situations as well as the urogenital tract is a usual finding. Massive doses of sulphanilamide are recommended by some workers. Protosil is less effective. Uleron is said to be superior and while continental workers are in favour of this, English clinicians prefer M. & B. 693, which they consider to be more constant in producing rapid and lasting cures. It is suggested that treatment with uleron and similar compounds should be begun after the first week so as to mobilise bodily defence. Hanschell (1938) found uleron more effective in gonorrhoea in the male than any other similar preparation. Uleron is effective in early gonococcal infection 5 to 14 days old but even more effective in infections of 21 days and over. Some workers have reported complications

like peripheral neuritis, palsy, hepatic and renal damage after uleron.

Batchelor *et al* (1938) report on 102 cases of gonococcal infection in males and females treated with M. & B. 693. In the majority of cases clinical cure was effected in a week and complications also improved rapidly. Toxic effects occurred in less than one-third of the cases and were quickly recovered from. The average daily dose was 3 g. maintained for an average of about 5 days and followed by a reduced dose of 2 g. for a maximum of 7 to 9 days. These authors do not consider there is any necessity to wait for immunity to develop; the drug is given as soon as diagnosis is made. Sulphur-containing foods, such as onions or eggs and purgatives like salines are prohibited during treatment.

Bowie (1938) records markedly quick cures in gonococcal urethritis and ophthalmia neonatorum with M. & B. 693. Results were better than with uleron and complications were less. Michie and Webster (1938) treated gonorrhoeal ophthalmia in children with success with 0.25 g. of M. & B. 693 twice a day. Fernandez (1938) reports similar success in adult cases.

According to Maegraith and Vollum (1938) soluseptasine should prove the most useful in gonorrhoea.

McElligott and Cokkinis (1938) believe that uleron is not superior to sulphanilamide in the treatment of gonorrhoea and has a greater incidence of toxicity. Their experience of 491 male cases and 142 female cases analysed in their report shows that the best results with sulphanilamide treatment in gonorrhoea can be obtained only by a specialised technique of administration and that incorrect or haphazard therapy is followed by

a large number of failures. *A degree of immunity seems to be essential to the attainment of optimum results, hence the importance of timing the chemotherapy correctly and combining it with immune therapy.* With the optimum technique advised, 89 per cent of male patients are cured with one course of three weeks' treatment, although the clinical manifestations usually clear up within the first week. With additional courses in cases of resistant or relapsed cases over 90 per cent success can be obtained. In men vaccine treatment is started at once within the first week of symptoms and continued twice weekly (starting with 5 and increasing to 100 million) throughout the chemotherapy. The irrigation, etc., are maintained. Sulphanilamide is started 8 to 10 days after appearance of discharge and continued for full three weeks. The daily dosage, which varies with weight, is usually 4 g., two 0.5 g. tablets being taken with a glass of water after the four-daily meals. After two weeks this may be diminished to 3 g. Apparent cure is expected in 2 to 7 days. After three weeks the treatment is suspended and the patient attends weekly for prostatic head tests, 3 to 4 weeks later, prostatic massage, vaccine (400 to 500 mill.) or alcohol provides the provocative test. After passing all tests the patient is kept under observation for a further period of 6 to 8 weeks.

In acute cases attending after the first week, the chemotherapy is started at once. In chronic cases the dosage need not exceed 3 g. daily and the total period may be cut down to about 17 days, while a mixed gonococcal vaccine may be given with advantage.

In women, the treatment is similar. Owing to their lighter average

weight, 3 g. is an adequate daily dose. At the end of three weeks if all tests are negative, treatment is stopped and the patient is examined fortnightly for one month and then after each period for a further two months, when if after a provocative vaccine injection, tests are negative the patient is regarded as cured. In chronic cases stovarsol pessaries are an additional recommendation. The conditions in women are not as satisfactory as in men, as the former are more susceptible to the minor toxic effects of sulphanilamide. *Interruption of the chemotherapy in the earlier weeks must be prevented at all costs.*

Almost all reports record that some 10 to 20 per cent of patients fail to respond, and it is also clear that, depending on the method of exhibition of the drug, a considerable number of patients may be placed in the dangerous state of being symptom free with a latent infection. *It is very important for the duty to realise that sulphanilamide has no value as a prophylactic.*

(5) IN URINARY INFECTIONS.—Kenny *et al.* (1937) treated 46 cases of B. Coli infection 16 of which were of pyelitis of pregnancy, and invariably secured a sterile urine within a week, often within three days. They found sulphanilamide superior to and cheaper and pleasanter than mandelic acid. It has been shown that sulphanilamide is much more bactericidal in an alkaline than an acid urine and the drug itself causes the secretion of an alkaline urine, probably by interfering with tubular reabsorption of bicarbonate and bases. In the urinary tract at least sulphanilamide seems to be directly bactericidal and urine containing it destroys added bacteria.

This treatment and mandelic acid complement one another, and have

separate indications. Mandelic acid requires a highly acid urine and good renal function; sulphanilamide acts best in the presence of renal damage. Mandelic acid is effective against *S. faecalis* infection, but sulphanilamide fails; mandelic acid is usually powerless against *Proteus* infection, but sulphanilamide succeeds. Sulphanilamide can be given in the acute stage. But mandelic acid is less harmful being less toxic. With sulphanilamide there is absence of nausea and digestive disturbances. The doses usually given are 0.5 or 0.6 g. *t. d. s.* for 5 to 7 days orally.

(6) TREATMENT OF CHANCROID WITH SULPHANILAMIDE.—B. A. Kornblith, A. Jacoby and M. Wishengrad observed the effect of this drug on a series of 45 cases of chancroid. The lesions which were positive for Ducrey's bacillus ranged from 18 mm. ulcerations on the prepuce to complete sloughing of the glans penis. The average duration was from four weeks to two years prior to treatment. Preliminary treatment with soap and water for a period of one week was instituted and if no results were obtained sulphanilamide was then given, consisting of the administration of 80 grs. of the drug in divided doses for the first five days and 40 grs. in divided doses for nine additional days. The treated cases healed promptly at the end of two weeks. No recurrence has occurred after six months. No ill effects were noticed. The treatment was ambulatory.

(7) IN STAPHYLOCOCCAL INFECTION, clinical verification is lacking although experimentally it is known that *S. aureus* is at least moderately susceptible to this treatment. Uleron (Hanschell 1938) in doses of 3 g. in 24 hours for 5 days

was found very effective and non-toxic. O'Brien and McCarthy (1938) found M. & B. 693 very useful in a case of acute staphylococcal septicaemia. Maxwell (1938) also reports dramatic recovery in a patient suffering from a staphylococcal blood stream infection, with consolidation of the left upper lobe of the lung by treatment with M. & B. 693.

Very few other diseases have escaped treatment with one or the other of this group of drugs, as exemplified below:

(8) IN GAS GANGRENE the results published are encouraging, sulphanilamide succeeding even where gangrene set in after prophylactic antitoxin.

(9) (i) IN BRUCELLA MELITENSIS INFECTION.—According to Neumann (1938) and others prontosil and other sulphanilamide preparations so far represent the most convenient treatment for undulant fever and may find a valuable place in the fight against this creeping and long drawn out disease.

(ii) IN BRUCELLA ABORTUS INFECTION.—Dalrymple Champneys (1938) reports on 35 cases treated with prontosil, prontosil soluble and sulphanilamide compounds. The results although not completely successful in all cases, justify the continued trial of these drugs in the treatment of these infections.

(10) Further reports are needed before we can assess its value in typhoid fever, etc.

(11) The prophylactic value of these compounds in various infections is doubtful.

(12) LOCAL APPLICATION. —Purdie and Fray (1937) describe a case of chronic wound infection due to hæmolytic streptococcus, following puerperal sepsis also streptococcal three years previously, where, after various operative procedures and actinotherapy had failed to give relief, oral administration of sulphanilamide in doses of 1 g. *t.d.s.* (total 94 g.) with local treatment with the same drug (1 per cent solution and dusting) was followed by sterilisation of the wounds within three weeks and complete healing in six weeks. Ointments have now been put on the market for similar conditions.

(13) IN EXPERIMENTAL PERTUSSIS in mice, Cruikshank (1938) found that the survival rate after infection was higher in those treated with M. & B. 693.

(14) Sir Leonard Rogers (1938) advises the cautious trial, in moderate doses and for a limited period, of sulphanilamide in cases of SPRUE and cites one case where improvement was remarkable.

(15) Experiments on human cases and in monkeys have failed to establish the usefulness of sulphanilamide in MALARIAL INFECTION.

(16) Of 37 dogs which developed canine distemper, 20 were untreated and 15 died. 17 were given sulphanilamide derivatives and only 1 died, perhaps as the result of too early stoppage of treatment.

Toxicity.—The toxic manifestations which appear in the course of treatment with sulphanilamide seem to occur on a basis of sensitivity and idiosyncrasy. The latter, while apparently rare, is serious and the former, whole more common, is usually mild

but may become serious if ignored (Barnick *et al* 1938). Most individuals seem to show some sensitivity when the initial doses of the drug are large or when the total administered amount is considerable. The toxic manifestations which occur with such doses are usually mild and consist largely of malaise, anorexia, nausea, vertigo and tinnitus. These symptoms may be due to an acidosis caused by the excretion of bicarbonate and bases due to diminished reabsorption in the renal tubules. With continuous doses these symptoms may be followed by cyanosis, abdominal cramps, diarrhoea, cutaneous lesions, fever, paræsthesias, and other more serious complications.

Cyanosis, in which the patient exhibits a strikingly blue colour, may be due to various causes: (a) *Methæmoglobinemia* may occur, as with other benzene compounds but is not serious and may clear up rapidly, especially if oxygen is given, (b) *Sulphæmoglobinemia* may occur when sulphates are given concurrently with certain drugs like pyridium and acetphenitidin. It is said that the formation of this compound from hæmoglobin and H₂S is catalysed by many substances especially amino compounds. But *in vitro* experiments have not succeeded in producing this result when sulphanilamide was used. But still, it has been suggested that the administration of magnesium sulphate just before or at the same time as the sulphonamides will cause the development of intra-corpuscular sulphæmoglobin (perhaps the H₂S is absorbed from the gut in greater quantities in the presence of much fluid in the lumen of the gut) and measures for averting it are directed to preventing the absorption of H₂S from the bowel and include a low residue diet and the avoidance of all purgatives, except liquid paraffin.

This condition may be very serious and even oxygen may be of little value. In some cases 6 weeks may elapse before all traces of sulphæmoglobin is got rid off.

Agranulocytosis has been recorded but fortunately is uncommon and perhaps is due to individual idiosyncrasy.

Acute anemia has been so far recorded in three cases.

Thrombocytopenic purpura may sometimes occur by itself or in association with the other blood changes.

Central nervous symptom, such as drowsiness may follow doses of 1 g. or more. Massive doses produce a feeling of extreme weakness and mental

apathy. Optic neuritis has been reported in one case.

Drug fever is said to have occurred after a latent period of about a week. It may also be due to a reaction due to products of lysed bacteria. A sharp polymorpho nuclear leucocytosis may occur in association with drug fever and rash, the symptom resembling those of Serum sickness.

Jaundice has been noted in two cases in which death occurred and in which possibly hepatic damage had pre-existed. Sulphanilamide may therefore aggravate an already existing hepatic damage. Mild attacks of jaundice usually subside rapidly when use of the drug is discontinued and intake of fluids is forced. These two measures are of extreme importance in combating toxæmia due to the sulphonamide group.

REFERENCES.

- Adair, Heselstine and Hae, 1938, *J.A.M.A.*, Aug. 27, p. 766.
 Barnick, Brown and Foster, 1938, *J.A.M.A.*, Aug. 27, p. 770.
 Batchelor, Lees, Murrel and Braine, 1938, *B.M.J.*, Dec. 3.
 Bowie, 1938, *B.M.J.*, Aug. 6.
 Bucy, P. C., 1938, *J.A.M.A.*, III, 18, p. 1639.
 Cruikshank, 1938, *Lancet*, Aug. 6.
 Dalrymple-Champneys, 1938, *B.M.J.*, Aug. 27.
 Domagk, 1935, *Dtsch. Med. Wch.*, Feb. 15.
 Domagk, 1937, *Klin. Wchschr.*, Oct. 9.
 Dyke, S.C., 1938, *Lancet*, Sept. 10.
 Fleming, A., 1938, *Lancet*, Sept. 3, p. 569.
 Fernandez and Fernandez, 1938, *Am. J. Ophth.*, July.
 Fritz Meyer, 1938, *B.M.J.*, May.
 Garrod, 1938, *Lancet*, May 21.
 Heathcote, 1938, *Medical Annual*.
 Hanschell, H. M., 1938, *B.M.J.*, Aug. 13.
 Horan, V. G. and Gay French, 1938, *B.M.J.*, Nov. 5.
 Kenny *et al.*, 1937, *Lancet*, July 17.
 Long and Bliss, 1937, *J.A.M.A.*, Jan. 2.
 Long and Bliss, 1937, *South Med. J.*, May.
 Macgrath and Vollum, 1938, *B.M.J.*, Nov. 12.
 Marshall, Emerson, etc., 1937, *J.A.M.A.*, March 20.
 Maxwell, J., 1938, *Lancet*, Nov. 26.
 McEllegott, and Cockinnis, 1938, *Lancet*, Aug. 13.
 Michie and Webster, *Lancet*, Aug. 13.
 Neumann, 1930, *B.M.J.*, Aug. 13.
 O'Brien, E. J., & McCarthy, C. J., 1938, *Lancet*, Nov. 25.
 Purdie and Fry, 1937, *Lancet*, July. 3.
 Reid, C. K. and Dyke, S.C. 1938, *Lancet*, Sept. 19.
 Rogers, Sir L., 1938, *B.M.J.*, Nov. 5.
 Whitby, L., 1938, *Lancet*, Nov. 12.

Clinical Singnificance of the Apex-Beat.

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The value of the apex-beat in the diagnosis of the diseases not only of the heart but also of the lungs is not stressed on the undergraduate mind. Even in the examination of the cardio-vascular system it is not uncommon to see the examiner omit to palpate and to locate the apex. Being so, that the diagnostic value of the apex-beat in diseases of the lung is overlooked, is not surprising. It is in the experience of the writer that cases of dextro-cardia are missed in individuals who present no symptoms and where the mere location of the apex-beat would have revealed a rare congenital anomaly. "With all our varied instruments, useful as they are, nothing can replace the watchful eye, the alert ear, the tactful finger and the logical mind which correlates the facts obtained" (Keen). It should be the fixed habit of every examiner to locate at once by inspection and palpation, the apex-beat.

Definition of the Apex-Beat.—The various definitions of the apex-beat are rather confusing. It should be emphasised that the beat is not caused by the anatomical apex of the heart. It would be more correct to call it the pulsation caused by the apical portion of the heart coming in forcible contact with the parietes in systolic contraction of the heart. "The anatomical apex formed by the tip of the left ventricle can come into direct contact with the thoracic wall only when the apex is situated far enough to strike the

lateral wall of the chest" (Dayton). "What is felt as the apex-beat is not due to slapping of the anatomic apex against the thoracic parietes, but to a sudden marked increase in the tension of the lower anterior surface of the right ventricle" (Norris and Landis).

How is this apex-beat to be determined clinically? It is defined as 'that point farthest to the left at which a definite forward thrust is imparted to the finger held perpendicularly to the chest' (Price). 'It is definitely to be understood to be outermost and lowermost point at which the pulsation is visible of palpable and not the point of maximum intensity' (Norris and Landis). No doubt in certain cases where the movements of the præcordium are diffuse and distributed over a large area the definite location of the apex-beat becomes a matter of considerable difficulty.

How is this apical thrust caused? The heart undergoes a change in consistency during the systole. It becomes hard and tense. In addition its curvature is increased as was shown by Ludwig by an increase in the antero-posterior and a decrease in the transverse diameter. The most important and powerful movement however, is lever luke; the heart revolves on its transverse axis so that the apical portion is raised and pushes against the anterior wall of the chest. This movement is of

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decided value in the formation of the apical thrust' (Dressler). In thin-chested individuals and where the heart is abnormal in shape and size or where the heart's action is vigorous, the impulse on the chest wall may be so widespread as to produce a "diffuse apex-beat" instead of a simple localised thrust. It is on account of these conditions that one has arbitrarily to stick, in defining the apex-beat, to the lowermost and outermost part of the pulsatile area which can definitely be felt as a thrust to a palpating finger held perpendicularly to the chest wall.

Normal Variations of the Apex-Beat.—Under normal conditions the apex-beat is in the left fifth intercostal space $\frac{1}{2}$ " internal to the nipple line (or midclavicular line). But it is essential to remember the limits of normality. Various factors influence the position of this apex-beat even under conditions of health. 'The fact that the apex-beat depends on one hand upon the position and action of the heart and on the other upon the position and action of the lungs explains a good many variations in its behaviour and position. The apex of the heart is behind a tongue-shaped process of the left lung and the thrust is effected through that portion of the pulmonary tissue. This explains the frequent diminution of the apex-beat during the inspiration.

In children the apex-beat is as high as the fourth interspace, rather higher than in the adult and usually inside the mammary line up to 3 to 10 years of age. After that age it gradually assumes the adult position.

In the aged it may descend as low as the sixth space. In women the apex-beat is a little higher. 'Very rarely and when the thorax is abnormally

long the apex-beat may be seen in the sixth space in perfectly healthy persons' (Krehl).

Even normally the apex-beat shifts with the attitude of the body. The position of the heart changes with that of the body. So the apex-beat is also found displaced to the left when an individual lies on the left side. The degree of such displacement is slight, a few centimetres in most healthy individuals. In some cases, however, the displacement is so great that the term 'wandering heart' is justifiable. In such cases it is possible that the extreme mobility of the heart depends on the great loss of thoracic fat. In the right lateral position, the apex-beat remains unaffected or is only very little displaced to the right in healthy individuals. A change from the horizontal to the vertical position has very little effect on the apex-beat. It is necessary to remember when examining a patient that the apex-beat is displaced during forced expiration, upward and during forced inspiration, downward.

Lastly, it must not be forgotten that the apex-beat may not be visible at all even in perfect health.

Clinical Significance of the Changes in the Apex-Beat.—The information that the cardiac impulse affords is varied. (1) It can supply knowledge regarding the heart itself, the condition of the myocardium, size, hypertrophy, or dilatation of its chambers, its rhythm, its relation to the enveloping pericardium and the function of the valves of the heart. It also serves as the time marker in relation to which the other events of the cardiac cycle can be interpreted; (2) To a certain extent, it can supply useful information regarding the condition of the lungs on either side of it; fibrosis,

atelectasis, consolidation, effusion, growths, etc; (3) Lastly and to a very limited extent, the information regards the condition of the viscera below the diaphragm.

Cardiac Conditions.—(A) **Position of the apex-beat.** (i) The apex-beat is a very good guide to the location of the left border of the heart. "Even for those trained in delicate percussion a useful method is to ascertain the site of maximum impulse. Then placing the tip of the thumb or finger an inch or more to the left of the maximum impulse, edge the thumb inwards little by little until the first slight but distinct thrust from within is perceived. This point, which is $\frac{1}{2}$ to $\frac{3}{4}$ " to the left of the maximum impulse is marked as the left border of the heart" (Butler).

(ii) The apex-beat coincides with the ventricular systole and furnishes a standard for determining time relations of other pulsations and thrills over the præcordium. The usefulness of this information will be appreciated while auscultating over the apex, for the lift of the chest piece of the stethoscope will give the time relation to any sound that may be coincidentally auscultated.

(iii) A very useful information which will be appreciated when X-ray facilities are not available is in regard to the size of the heart when the position of the heart itself is normal. The heart being limited at the base by the diaphragm and by the root of the great vessels above can register its increased volume only by moving either to the right or left, its borders, and it is precisely to this fact that the apex-beat owes its value as indicator of the size of the heart. Both hypertrophy and dilatation have their effects upon the character and position of the apex-beat. It is very

important to distinguish between an apex-beat which has been displaced and one which has been uncovered by retraction of the lung. Displacements of the apex-beat may also occur as a result of causes, which are outside the heart and their consideration will be taken up later:

(a) a shift to the left without much downward displacement is characteristic of dilatation of the right ventricle. A characteristic rotation of the heart takes place round a vertical axis so that more of the right ventricle comes in contact with the anterior chest wall and the left border of the cardiac silhouette is formed entirely by the right ventricles and the pulmonary conus;

(b) a displacement to the left and downward is usually indicative of left ventricular hypertrophy (or dilatation, less often) "In many textbooks the fact is noted that the apex of the heart in well-marked aortic regurgitation lies at a relatively lower level than is the case when the enlargement is due to mitral regurgitation. Various reasons are given but I have not come across the following which seems to be the true explanation: In such cases the lowering of the apex-beat is in all probability due to the displacement of the whole heart rather than simply to a special downward increase of the left ventricle alone. The explanation of the downward displacement is to be found in the over distension of the first part of the aorta which is a necessary consequence of the compensation in well-marked aortic regurgitation." A similar displacement may also result from aneurysm of the aorta or stretching and elongation of the aorta from arteriosclerosis;

(c) a pure downward displacement of the apex-beat is rare.

Clinical Significance of the Apex-Beat

(d) the only cardiac condition which produces misplaced apex to the right is the right-sided heart (congenital dextrocardia); and

(e) displacement upwards is common in pericardial effusion among the cardiac causes. "The apex of the heart may be displaced upward in anæmia dilatation of the organ by means of a rise in the average level of the diaphragm upon which it rests or by means of a simple downward extension of the right ventricle which raises the apex by means of pressure against the diaphragm. Or the apex may be raised in consequence of the left ventricle being swung outward and upward around its basal fixation as centre in order to allow of an increase of the right ventricle towards the left. Another cause appears to be the simple shrinkage in the size of the heart as accompanying the diminution in the total volume of blood in active circulation."

(B) Character of the apex-beat. Like the pulse the apex-beat can give information regarding the rate, rhythm and force of the cardiac contraction. In auricular fibrillation a count of the apex-beat is a more reliable indicator of the heart action than the pulse for obvious reasons. A palpation of the apex-beat may reveal thrills associated with valvular disease. Various characteristics of the apex-beat give information regarding the condition of the myocardium.

(i) A 'heaving' apex-beat is the only clinical manifestation which is a sure guide to the determination of a hypertrophied heart: 'a physical sign which may reveal hypertrophy before enlargement is unequivocally demonstrable.' It imparts to the palpating finger a sensation of being lifted with considerable force and feels

hard. Such a heaving apex-beat is characteristic of left ventricular hypertrophy. It is not to be confused with a merely conspicuous apex-beat of large amplitude or wide extent. "This heaving character of the apex-beat may not be demonstrable in emphysema or inside a thick chest wall or even if the apex is rotated away from the chest wall by a coincident enlargement of the right ventricle" (Fishberg).

In some cases this heave has demonstrable deliberateness; a 'slow heave' which is sustained. "The thrust of the apex-beat is slower and takes place over a longer time than in cases of pure hypertrophy of the left ventricle. Such an apex-beat is typical of aortic stenosis" (Price).

"What is termed 'resistance of the apex-beat' is measured by the force required to obliterate it and is a direct and reliable sign of the strength of the heart in the same individual and at various times provided that the left ventricle has not changed" (Krehl).

(ii) Apex-beat of large amplitude is encountered in overacting (coffee, tea, alcohol, acute fevers, etc.) or dilated hearts; rarely, it is the consequence of unusually thin chest wall or wide apposition of the heart to the parietes as in pulmonary retraction. The apex-beat will lose its heaving character when pronounced dilatation supervenes on previous hypertrophy (Fishberg).

(iii) A sharp slapping impact of the apex is seen in great frequency of the heart's action, especially in mitral stenosis. "The snappy first sound of mitral stenosis heard on auscultation is also palpable as an abrupt apical shock. The snappy character is attributed to the rapid systole resulting

from small filling of the left ventricle and a shortened ejection phase" (Fishberg).

(iv) A feeble tap which is almost imperceptible is seen when heart muscle is diseased or towards the end of an acute fever. Naturally the value of this sign will depend on previous knowledge of the apex-beat. It may be so in dilatation of the right ventricle, pericardial effusion, extensive pericardial adhesions, etc.

(v) A shock or jog is sometimes felt at the apex in consequence of a sharp closure of the pulmonary and aortic cusps (Hutchison and Hunter).

(vi) A rare condition is what is described as a 'double apex-beat' often in gallop rhythm, the gallop sound is accompanied by a palpable and sometimes a visible impulse. The impulse may be very prominent and give the impression to the palpating hand of a double apex-beat. In eliciting the gallop rhythm one should always employ simultaneous auscultation and palpation. This may be accomplished by auscultating with the naked ear (Fishberg).

The split first sound of bundle-branch block may be accompanied by a 'double apex-beat'.

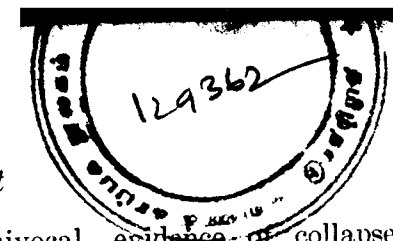
Respiratory Conditions.—The heart may be displaced to the right or left by pathological changes taking place in the mediastinum, the pleural cavities or the lungs.

Mediastinum has been described aptly as that space in the thorax not filled by the lungs (Bushnell). As the heart is incorporated in the mediastinum a shift of that viscus as evidenced by the apex-beat will depend upon the mobility of the med-

astinum and upon the relative pressures in the pleural spaces. It is impossible for the apex-beat to be affected if the mediastinum be fixed by inflammation. In such case, the apex-beat fails to give valuable information, with reference to the condition of the lungs. The differences in the lung volume brought about by disease or injury will cause a shifting to the impaired side of the apex-beat, the extent of which is determined by the size or elasticity of the affected lung or the degree of negative pressure developed. Thus the displaced apex-beat will be the outstanding physical sign in pulmonary disturbances of this character (Smith). However, much of its clinical value will be lost in deformities of the chest such as kyphosis, scoliosis, etc.

Effects of pulmonary changes.—Normally the apical thrust on the chest wall is through a tongue of the left lung. Depending upon the mobility of the lung, during recession of the heart from the chest wall in systolic contraction, the left lung expands to occupy the space vacated by the heart as otherwise, the chest wall will be sucked inwards and produce a retraction (Dressler). Thus this part of the left lung has an important part to play in determining the extent to which the heart can come in contact with the parietes.

In emphysema, consequently, the apical thrust may be considerably diminished or may even be absent. Another effect of emphysema is to depress the diaphragm so that the heart is carried down with it and the apical beat is displaced downward. On account of the inspiratory position of the chest the ribs go up with a relative downward displacement of the normal apex. Lastly, emphysema is frequently associated with a right



ventricular hypertrophy and this, as has already been pointed out, contributes to the displacement of the apex.

The effect of pulmonary fibrosis on the apex-beat is marked. It exposes a greater portion of the heart which comes in contact with the chest wall and thus produces a broadening of the apex-beat. 'In a well marked case, the impulse is visible and palpable in the third, fourth and fifth spaces, sometimes slightly in the second, and the snap of the arterial valves may be very distinct' (Butler). Along with the heart the mediastinum and tracheæ may be pulled to the side of the disease.

The effects of long standing bronchiectasis are very similar to those of pulmonary fibrosis from other causes.

Neoplasms of the lung will affect the apex-beat according to the manner in which they dislocate the mediastinum.

Pneumonia has practically no effect on the apex-beat in as much as it rarely affects the physico-dynamics of the mediastinum. On the contrary, massive collapse, which very closely simulates lobar pneumonia, produces marked changes in the position of the mediastinum and consequently on the position of the apex-beat. The pleural pressure is considerably reduced on the side of collapse, the delicate balance between the two lungs is disturbed and the heart is displaced to the side of the collapsed lung. This is a very valuable sign in diagnosis of the lung condition. Its usefulness will be appreciated if it is remembered that the physical signs of pneumonia and collapse are practically alike. The displaced apex-beat gives un-

equivocal evidence of collapse. Its position is equally important when confronted with the possibility of pleural effusion. In pneumonia the apex-beat is normal; in collapse it is displaced towards the side affected and in pleural effusion it is displaced to the opposite side.

As is to be expected, affections of the pleura profoundly disturb the position of the apex-beat. Pneumothorax, effusion, purulent or otherwise, displace the apex-beat and the mediastinum away from the affected side on account of the increased pleural pressure. It is important to remember that such changes can take place only when the mediastinum has not been fixed by inflammatory process. In majority of the cases the effects on the apex-beat are minimal as the causes for the changes in the pleura are usually chronic. On the contrary in acute conditions there is nothing so valuable as the displaced apex-beat in diagnosis.

Mediastinal tumours affect the apex-beat by their mechanical action of pressure. Consequently, the displacement of the apex-beat will depend upon the situation of the tumour. Under this category are to be included aneurysms of the heart and aorta.

Sub-Diaphragmatic Causes.—The value of the apex-beat on the diagnosis of these conditions must naturally be very limited indeed.

The common causes operate by increasing the intra-abdominal pressure and elevating the diaphragm. These are ascites, pregnancy, abdominal tumours, extreme flatulence, obesity, etc. Of the unusual causes may be mentioned and enlarged and congested liver and eventration of the diaphragm.

31. 18.2

An enlarged and congested liver by dragging upon the central tendon of the diaphragm and the pericardial sac has pulled the heart downward.

Although these causes may operate

in displacing the apex-beat they do not help clinically, in diagnosis, either of the condition of the heart or of the causal pathological condition.

REFERENCES.

1. A Text-book of the Practice of Medicine by Price.
2. Heart Failure by A.M. Fishberg.
3. Clinical Methods by Hutchison and Hunter.
4. Diseases of the Chest and their Physical Diagnosis by Norris and Landis.
5. *Nothnagels Encyclopaedia of Medicine*
6. Diseases of the Myocardium, by Krehl.
7. Physical Diagnosis by Butler.
8. International Clinics, 1937, Vol. ii, page 193.
9. "Pulsations of the Wall of the Chest" by Dressler. *Arch. Int. Med.* 1937, 60, 225.

Military Surgery in Northern India.

BY CAPTAIN G. B. THOMAS, I.M.S.,

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Surgery has always had its high-lights: in India there are sidelights too. Near the N.-W. Frontier they gleam at times with a peculiar brilliance that illumines the background of one's surgical adventures, so that one recalls them later with a feeling almost of nostalgia. I fear I shall be unable to conjure up this background, but should any of my readers later on be called upon to work in that part of India they too may experience its charm.

This is not intended to be a formal account of an interesting case merely, though I have always thought it instructive. It is written also to show the type of work one has to do on occasion as a Surgical Specialist in the Army.

One cold night in January, when I was Specialist in Peshawar, I was asked to go to a station some 30 miles distant to see a case of abdominal injury. Now Peshawar is surrounded by a perimeter of barbed wire 11 miles in circumference which is closed at night, and nobody is allowed to leave the Cantonment without a pass from the Staff Captain. However, in virtue of my job I was in possession of a permanent pass and so had no need to find this officer—not always an easy matter in so large a station—and extract a pass from him. I moreover had attached to me a personal orderly whose duty it was to accompany on these expeditions, supposedly as a

protection. This was by no means an unnecessary precaution as from time to time officers travelling late at night along this road were held up and robbed and more often than not seriously assaulted. Tribesmen often used to lie in wait, and dacoits were sometimes in the district. Had one been held up it would have been doubtful policy to show any resistance as the dacoits were experts at their game, and would cheerfully murder anybody whom they suspected to be in possession of firearms, which they found it difficult to get hold of by lawful means. So a journey at night always had a certain flavour of adventure. As a matter of fact I travelled this road many times at all hours of the day and night before I left Peshawar and never met with any trouble, but the week after I left the station for good two British troops were shot in broad daylight.

It was about 10 p. m. by the time I arrived at my destination. The patient was a little girl of 11 who had been kicked the previous day by a horse in the abdomen on the right side. Her pulse was beginning to rise and her condition to deteriorate and it was obvious that her abdomen would have to be explored. It seemed quite probable that she also had some damage to her right kidney as she had had a little hæmaturia for a short time after the accident, though this had by now cleared up. I decided that the proper course was to open

the abdomen as she was very tender and rigid in front, and I was afraid that even if I found a kidney lesion by the more convenient lumbar incision I should have to explore the abdomen for second injury. The hospital was a very small one and operations were seldom performed there, but the R. A. M. C. orderlies prepared the theatre remarkably well. There was a shadowless lamp, but the instruments were not intended for major surgery, whilst the operation table was merely a table made of metal instead of wood and could not be adjusted in any way. The Families' Hospital was some 300 yards away from the theatre and as I have said it was a cold night. However, we wrapped the patient up and carried her across on a stretcher. The O. C. Hospital gave a magnificent anaesthetic, and I opened the abdomen by a right paramedian incision. There was a small tear in the right lobe of the liver which was easily dealt with, but what most striking was the marked ecchymosis seen beneath the peritoneum of the ascending colon. I looked further and there in the right paracolic fossa was to be seen a huge retroperitoneal hæmatoma—there was obviously a rupture of the right kidney. I carried a transverse incision from the centre of the original wound right out to the flank, as advised by Rutherford Morrison, packed off the intestines, and incised the hæmatoma through the peritoneum of the paracolic fossa. The rush of blood was appalling, and as I compressed the aorta I glanced at the child's face, it turned pale even as I looked. My assistant compressed the aorta in my place, I rapidly threw a mass ligature around the kidney pedicle and removed the kidney. It was ruptured horizontally into two complete halves. A stab wound in the loin and a rubber tube sufficed

for drainage and the abdomen was closed. We then turned a couple of buckets upside down placed the two legs at the bottom end of the table upon them, and gave an intravenous saline. After about an hour, this treatment and the warmth of the theatre produced a great improvement in the patient's condition, and she was put on the stretcher and carried back the 300 yards to her ward.

I went back to the O. C.'s bungalow before going home and had wonderful glass of sherry. Its flavour mingled with the glorious early morning air as I drove back to Peshawar, and its memory remains gratefully with me still. We met with nothing on our return but processions of bullock-carts, their drivers asleep and the eyes of their cattle gleaming greenly in the headlights. This was the only warning of their presence as they carried no lights themselves, but as the road runs straight as an arrow for mile after mile they would be seen very far off. I roused the sentry at the perimeter gate at about 4 a.m. and having satisfied himself that I was not a dangerous Pathan come to take the city by storm, he slowly wound open the heavy gate.

I rang up every day to enquire how she was, and went over once or twice as well in the next few days. All seemed well until on the sixth day I received an urgent message to go and see her as things were not satisfactory. I finished the appendix I was doing and my Morris 10 covered the 27 miles in 35 minutes. Her pulse and temperature had been steadily rising since the previous evening and she had started to vomit. Her upper abdomen was distended and resonant but the lower was almost scaphoid, I had removed the

drainage tube a day or two before and I had my suspicions. Again the tedious wait while all was made ready for an operation—a slow business on small Primus stoves although a start had been made before I arrived. And again the long carry for the little girl on the stretcher (though she stuck it like a brick) and again, thank Heaven, a superb anaesthetic by the O. C. The wound was found to be septic as soon as the skin was opened. The abdomen contained a little clear fluid but there was no peritonitis. But the stomach was enormously distended while the guts were collapsed. On exploring the kidney fossa a large abscess was found, shut off from the rest of the abdomen by the omentum. The posterior wall of the abscess was formed by the duodenum. It was, of course, acutely inflamed and covered by granulations. Its diameter was about 1½" and it was in a state of ileus. Hence the distension of the stomach, the vomiting, and the collapsed condition of the rest of the guts. The pus was evacuated and the drainage tube re-inserted. Again she was resuscitated, and after that she never turned a hair.

Intestinal obstruction due to the involvement of a loop of ileum in a collection of pus in the pelvis is a well-known condition. The involved loop becomes inflamed and paralysed and produces obstruction just as complete and just as fatal as one due to bands. If several loops of bowel are so involved the best treatment is often to perform ileo-colostomy. In this case the condition was exactly analogous, but duodenum

in the kidney fossa was involved in the inflammatory process instead of ileum in the pelvis. The state of affairs might have been mistaken for acute dilatation of the stomach, but the rising temperature suggested an inflammatory process somewhere. Moreover, I had feared from the outset that the kidney fossa might go septic—the ploughed-up, blood-stained peri-renal fat was obviously a likely soil for infection and the adjacent contused ascending colon a likely source. It is particularly interesting to note how rapidly the duodenal ileus cleared up after the pus was evacuated; apart from the ordinary post-anaesthetic vomiting she vomited no more. One might have been tempted to perform a gastro-enterostomy, just as one performs ileo-colostomy when bowel is involved in the pelvis. The problem in the latter case is not quite the same, however. There, many inches of gut may be inflamed as several loops may be dipping into the pelvic abscess and speedy recovery is more problematical. In my case not more than 2½" of duodenum passed through the abscess. In any case, such a major procedure would have been quite out of the question in a little girl who had lost one kidney only six days before, and was fit only for the least possible surgical interference.

The child and her family moved to a distant part of India as soon as she was fit to travel, but I met her father again nearly two years later. I was glad to hear his daughter was in excellent health and was, moreover, a very keen rider.

Essential Hypertension

(SYNONYM-HYPERPIESIA),

BY S. G. RAJAGOPAL, FINAL YEAR.

Essential hypertension is a condition in which the blood pressure is raised due to some, as yet unknown cause. By the term hypertension is meant a permanently raised blood pressure both systolic and diastolic. A temporary rise in blood pressure is of no significance as it may occur in conditions like emotion, excitement, etc.

Etiology.—The etiology of essential hypertension is still obscure. The incidence seems to be on the rise in civilized population. Strictly speaking it is not a disease *sui generis*.

Various theories have been put forward as to its causation, among which the following are worth mentioning :—

1. Modern city life with its shocks, worries and excesses in alcohol and tobacco.
2. Obesity :—Especially when due to over-eating or excessive drinking. In these conditions there is always a raised blood cholesterol which seems to be a precursor of arterial changes.
3. Some congenital abnormality in blood vessels supplying the vasomotor centre.
4. Thrombosis or atheroma of the vessels supplying the vaso-motor centre.
5. Atheromatous degenerative changes of the carotid sinus. This seems to be common after the age of forty.

6. Tumours of the suprarenal.
 7. Accumulations of certain pressor substances in the body not eliminated.
 8. Lack of normal metabolites in the body. Two substances have been isolated from the pancreas. These are said to have the power of reducing and keeping under control the blood pressure in some people, lack of excretion of these substances leads to high blood pressure.
 9. Endocrine disturbances like dysthyroidism. The heart of hyperthyroidism and hypertension resemble each other. In both there is raised blood pressure and increased output of the heart. This theory has some ground.
- Physiology and Pathology.*—The systolic pressure indicates a maximum work of the heart. The rule systolic pressure should be the age plus hundred is not a rule but a superstition. Any pressure above 130 m.m. in young people and 150 m.m. in older people is to be regarded abnormal. The lower limit is 100 m.m.

The diastolic pressure represents the resistance to be overcome by the heart when the aortic valves open. The diastolic pressure is more constant and more significant and less liable to fluctuate. A diastolic pressure of 100 m.m. is to be considered abnormal and in young patients even 90 m.m.

Essential Hypertension

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The normal pulse pressure varies from 30 to 50 m.m. A pulse pressure persistently 20 m.m. and low, or 50 m.m. and above may be considered as abnormal.

The maintenance of normal blood pressure depends upon four factors, modifications of which may cause it to alter. These factors are :—(1) The cardiac factor in which supertension may be associated with cardiac hypertrophy as in mitral regurgitation, etc. (2) Arterial factors in which there is arteriosclerosis and arterial spasm associated with various causes. (3) The tone of the arterioles and capillary peripheral resistance. (4) Hæmic factors, an increased blood volume associated with over-eating and over-drinking.

Pathology.—There is hypertrophy of the heart and media of the smaller arteries. The internal elastic lamina splits up and reduplicates. In the afferent arterioles of the kidney the intima is hypertrophied and becomes elastic. Following this the efferent arterioles of the kidneys get sclerosed and fibrosed and the whole nephron gets destroyed. The distribution is patchy, the kidney as a whole is not destroyed but the major portion of it may be.

Signs and Symptoms.—These may be described in three stages :—

The First Stage.—In many there may not be any symptoms at all. In others they usually manifest after an age of 40. The patient may be plethoric and well nourished. He is unaware of the disease. The rise in blood pressure on an average is between 160 and 190 m.m. The diastolic pressure rarely goes over 90 m.m. The average pulse pressure being about 70 m.m. There is no evidence

of cardio-vascular hypertrophy. In this stage the urine, the renal efficiency and the blood chemistry are all normal.

The Second Stage.—This stage is associated with symptoms which are vague and mental. The patient complains of headache, giddiness and exhaustion. He has no inclination to do any work. Insomnia with failing memory is a common feature. In addition he may complain of lassitude, throbbing of the head, breathlessness on exertion and recurrent hæmorrhage which may temporarily relieve the condition.

On examination definite evidence of cardio-vascular hypertrophy is seen. The apex-beat is displaced downwards and outwards. The first sound is muffled and prolonged, and the second sound accentuated at the base. The systolic pressure may be as high as 230 m.m. rarely as high as 300 m.m. and the diastolic pressure of about 100 m.m.

The urine may show traces of albumin. A few R. B. Cs. and a few granular casts may be seen. The concentrating power of the kidney is diminished but not markedly. The blood chemistry is normal.

The Third Stage.—The stage where complications set in. The more important of them are cardiac failure and cerebral hæmorrhage. These complications do not co-exist, *i.e.*, in cases with cardiac failure cerebral hæmorrhage is rare and *vice versa*.

A third complication is incipient uræmia which is due to damage to the kidneys. If uræmia is well established the prognosis is grave.

During this stage the systolic pressure tends to fall while the diastolic does not alter.

Diagnosis.—The diagnosis of essential hypertension from chronic interstitial nephritis is really difficult in the last stage. The following points aid in differentiating them.

(1) *The Patient.*—The patient of renal disease may be of any age, he is pale and thin, while the hypertensive patient is usually over 40, commonly 50 and looks normal, florid and well built.

(2) *Urinary Changes.*—In kidney damage the urine is of low fixed S. G. and the range of concentration is low. It is pale like water, there is no deposit, but there is a fair amount of albumin. In essential hypertension the urine is of fairly high S. G. except in late stages. It is of a straw yellow colour. There is no deposit and no albumin (occasionally a trace). Microscopically nephritic urine shows granular casts and a few R. B. C. while in the other case only a few hyaline and granular casts may be seen.

(3) *Cardio-Vascular Changes.*—The heart in chronic interstitial nephritis is not greatly hypertrophied. The blood pressure is not very high. The systolic is about 160 to 180 and the diastolic 120 to 140. The pulse pressure rarely goes over 40.

In hyperpietic cases there is marked cardiac hypertrophy. The systolic pressure is very high and the diastolic relatively low (diastolic high in late stages owing to fall of systolic). The pulse pressure is usually over 90.

(4) *Retinoscopy.*—The retina of nephritic patients show definite evidence of albuminic retinitis with hæmorrhages in many cases. In hypertension only hæmorrhages are common. In late stages exudate may

be seen. The arteries are spastic and resemble silver wire.

(5) *Blood Chemistry.*—In nephritis there is great accumulation of nitrogenous metabolic products while this is rare in the other case.

(6) *Complications.*—Complications of nephritis are commonly uræmia, cerebral hæmorrhage and heart failure while common complications of essential hypertension are heart failure, cerebral hæmorrhage and rarely uræmia.

Prognosis.—This depends upon the height of the pressure and the condition of the heart and arteries. A high diastolic reading is always of grave significance. The average duration may be about 10 years from the onset of symptoms. Prognosis is more favourable in men than in women.

Treatment.—The treatment is mainly prophylactic, hygienic and dietetic as there is no specific treatment.

Each case must be treated on its merits. The main object should be to identify and if possible remove the cause. There should be no indiscriminate lowering of the blood pressure. It may be an attempt by nature at compensating other causes. Especially in the aged the sudden lowering of a raised pressure may bring in untoward symptoms and may even terminate fatally.

The value of rest both physical and mental is great and is not sufficiently appreciated. It is sometimes necessary to keep the patient in bed, the period varying according to the nature of the case. Particular attention should be paid to this especially after heavy meals and lastly good sleep should be ensured at nights.

Exercise, provided it be moderate and regulated is of high therapeutic value. These should be gentle as golf, walking, riding, etc., and should be such that they are beneficial within the limits allowed by the heart. Overwork, sudden strain, hurry, straining at stool and mental worry of any kind should be carefully avoided.

Diet plays an important part in the treatment of this disease. Various views have been launched forth with regard to this question. Some lay great stress upon the necessity for drastic regulation of diet while others differ. But it is important for the patient to avoid dietary excesses of all kinds both in regard to quantity and quality of the food. The numbers and bulk of the meals should be limited. Such of those articles of food which stimulate the cardio-vascular system should be reduced.

A sufficient amount of fluid should be taken to allow for the excretion of about 3 pints of urine. A glass of hot water an hour before each meal is of great value. An exclusively milk diet combined with rest has been useful in some cases.

Excessive drinking of alcohol and smoking of tobacco should be reduced and if possible avoided. Coffee and tea should be moderately consumed. Sex activities must be limited.

Purgatives are certainly useful. In all these cases constipation should be avoided. A slight laxative action on the bowels is of great value than a large purge. Mild aperients as senna, liquid paraffin and sulphur may be used.

Bathing every day in luke warm water is good. The function of the skin should be encouraged. Proper clothing should be provided depending upon the season. Recently some physicians have advocated diathermy and turkish baths.

The treatment of essential hypertension by drugs is a question of individual opinion depending on the particular case. While nature is making an attempt to keep the pressure high for its own reasons it is obvious one should not try to lower it by a direct action on the heart. Hence drugs should be of the nature as to lower the pressure by producing peripheral vaso dilatation. This may be done by the use of nitrites. Pot iodide and iodine are time honoured drugs but their action is mild and not well understood. Thyroid extract has been beneficial in some cases. In cases of hyperiesia with severe headache and vomiting auto-hæmotherapy has been successfully tried by a few.

Lastly in full blooded, when the heart is beginning to fail and hypertensive cerebral attacks threaten venesection of half to one pint of blood is valuable and produces rapid amelioration of the symptoms. This may be repeated as often as necessary. In cases with marked arterial sclerosis it is wise to remove two separate half pints of blood at a few days interval to prevent the occurrence of cerebral thrombosis.

I am thankful to Dr. D. Govinda Reddi, M.D., for kindly helping me in preparing this article.

Musings.

BY ' G '.

When I open my mouth to sing O! you
The words that come are poor and few :
Alas! The cruel muses forsake me
When I want to sing of the beloved she.

My song about you is long and sweet
Like a wreath of roses we rarely meet,
And I make an' make but never finish
For there is no end to a true wish.

In the sweet stillness of the evenings
One can hear your name in my musings,
O! how I long to sit by you in this strife
And sing an' sing my one song in life.

A beauty cast in beauty's mould
Thou art who hath charms untold
And I am always dreaming of you
Which I think is known to a few.

Since I saw you on the first occasion
My liking for you has slowly grown
And to-day it is a sweet emotion
Which I think you too have known.

Though the blue has many a star
Yet only one is the brightest of all,
O! how I wish you be that northern star
To guide me till I answer the last call.

Alas! I am poor but thou are not
And that's my one worrying thought ;
'Do not pine an' 'long ' my fears do say
But true love shows me the heavenly way

In all my life I did never pray
But now for once to you I wish to say,
How unhappy I am in this strife
Without you that art my whole life.

I am pining to come to your temple
With a heart pure and simple,
Alas! I have nothing to offer but love :
Wont you my homage with pity approve ?



The College Dining Hall.

Dinner Gongs.

By "G."

Has forgetfulness been classed as a disease? If not it is high time that someone takes up a research in that direction. Whether it is a disease or not many people suffer from it. It is a disease quite common among the students (not to speak of others), which assumes an epidemic form during the examinations, when most unfortunately, the casualty rate reaches the highest mark. The only people that seem to be rather immune to it are the money-lenders, business men who deal on credit system and to a certain extent some teachers who cannot forget the faces of some unfortunate students of their own. Dr. Johnson first remarked that all people suffer from insanity, the difference being only in degree. That statement will hold good also in the case of forgetfulness. Some people seem to be very much forgetful of things than the others. As for instance there are some, who when they go for a walk with their wives, go ahead, without even caring for any accident which their poor wives might come across. And such a behaviour as that is not due to any want of consideration on their part towards their wives, but out of sheer forgetfulness. I know of a particular case where a husband and wife went to a theatre. After the show was over the husband returned home alone, for he forgot that he took his wife also with him. Such a case as the above one my medical friends would opine as an instance of "advanced forgetfulness". And there are some others who forget just for a time and something or other they might see or hear would be

enough to remind them of the forgotten thing. Can we class these among the cases of temporary forgetfulness? If so with pardonable pride, I would like to class myself as one amongst them.

I have tried all sorts of remedies, as for instance by keeping an engagement book, to get myself cured of the disease but in vain. Every night I went to bed, I made a solemn vow to look into the engagement book the next morning, and invariably I have failed to do so—again that damned (excuse the word) forgetfulness. And on only one occasion I had a temporary relief from it, and that was perhaps due to the nature of the engagement, a marriage anniversary dinner. I am always partial to good dinners, a fact well known to my friends and relations. So I never fail to get dinner invitations from them. And to be plain, I don't bother myself to give them any such thing in return. I may, if chances permit, be a host to them in my next life. On the particular day of the dinner mentioned above, I didn't forget to look into the engagement book though I forgot about it later, after I left the lodge.

It was not a Sunday, but it was a holiday on account of something, which I have again forgotten. That morning I read in the engagement book the words "marriage anniversary dinner at Mr. and Mrs. Krisnamoorthi's at 8 P.M. sharp." In the morning I made a choice of the dress I should wear for the function and placed it on the trunk, lest I should

forget to wear it. After breakfast I had a nap, as I usually do on holidays. In the evening I dressed up and left the room at six o'clock. Before starting out, I looked into the engagement and made sure that the dinner was on that day and that too at eight o'clock at night. As I was standing on the road waiting for the tram, my friend Mr. S. came that way in his car. As soon as he saw me, Mr. S. pulled the brakes and said "Hello! what about a spin on the Marina". I told him "Sorry I've an engagement at eight". Mr. S. said "Two solid hours before eight. I'll leave you free by seven-thirty. Now come on, be a good boy". My arguments were of no use and five minutes later I was on the beach opposite the Queen Mary's College.

Now I do not regret for having gone there, though I had to be a little late for the dinner. The day was fine and the elite of the city had gathered on the beach to spend the evening in a holiday mood. If some one quite new to India had been dropped there from an aeroplane and taken back again after an hour's sight at the people gathered there and the pile of motor-cars (only the dealers might have known how many of them were purchased on hire-purchase system) parked along the kerb, I am sure, that the stranger would have gone away with the impression that India is one of the most prosperous and flourishing countries of the world full of charming beauties in the topmost rung of civilisation. Such a grand sight the Marina; I mean that particular part of the Marina between the Office of the Inspector General of Police and the northern boundary wall of the Queen Mary's College; in general on holidays. I would like to go a step further and say that that part of the Marina can be called an international

zone, for it is quite innocent of any racial, religious, or provincial feelings. There, on such an evening, as that is presented on a holiday, one can see a well-built northern youth with his patriarchal beard and coloured turban walking side by side with a southern belle, all the while engaged in a *tete-a-tete*, or a follower of Islam conversing with a girl of the Hindu fold in the most happy mood. Ministers, Justices of the High Court and the petty clerks that toil night and day in the offices, gentlemen and sons of gentlemen, who are blessed with the only business of parading the Marina in the evenings "in all splendour drossed"—all these walk on the same pavement enjoying the call of evening's beauty. For once it seems as though the people forget this time quite welcome) of the so-called divisions made by man and rise above on the platonic plane and think with the poet that

"All the world over there is but a race;

And that is the Human Race;

All the world over there is but one community

And that is Man."

How I wish that such a state of affairs continued for ever, and man thinks of man as a twin soul in the realisation of the Thing Eternal.

We were sitting on one of the benches observing the concourse of people that were parading the pavement, some with the idea of showing their charm to others, and some others with the idea of 'hooking' eligible men for their daughters (all peroxide beauties) who had also come there—all sorts of people with

heterogeneous ideas but homogeneous in their one desire of presenting themselves at their best to the public. After some time my friend left me and went for a walk, asking me to wait till he returned. It was past six forty-five and I had entirely forgotten about the dinner. I was looking and admiring at some of the beauties that passed by me. One of the girls in a group that passed by was really very charming. She was of a desirable height, gracefully slim, and a bit quick in her steps. Her complexion was fair, and the hair which parted at the right not far from the centre and flowed in lovely curls was made into a single plait at the back. The liquid eyes bright with intelligence, were the very heralds of the cupid fair. And the enchanting smile that hovered round the rosy lips added grace to the helenic beauty in her. Her dress, a beautiful blue coloured sari revealed the pleasing curves of the body beautiful. To keep pace with her companions, she walked slowly, which seemed to be in tune with the music of the universe. She turned her head towards the moon that was peeping out of the dark blue waves beyond, and stood awhile lost in the admiration of nature's beauty. Evidently, she was an artist, or a poetess, for none of the girls except this one, seemed to be aware of the charm and beauty of the rising moon. I was lost in my admiration of the beauty of her. Something about her seemed to awaken me from my forgetful slumber and in a hurry I got up from the seat to the great astonishment of the people around. I looked about for my friend, and he was not to be seen anywhere. It was past seven and the dinner was at eight. Seven miles to cover before I reached my friends' residence in Kilpauk. In a hurry I left the beach without my friend.

By the time I reached my destination it was half an hour past eight. After much disappointment my friends had sat for their dinner. When I entered the house, I was quite welcome. I tendered my apologies and took the seat reserved for me. During the course of the dinner Mrs. Krishna-moorthi asked:

"Well Mr. G. we were really wondering what had become of you. Why this delay?"

I had half a mind to tell some excuse or other, but better conscience prevailed over me and I told the truth.

"You see, it happened like this, I left the lodge to come here and as I was waiting for the tram a friend of mine came that way and took me to the Marina. So this delay."

"You could have told him that you had this engagement."

"I did of course. But that chap insisted on my going along with him and he said that he would leave me free by seven-thirty..."

"Perhaps...he dint."

"No...no nothing of that kind. After going to the beach I entirely forgot about the dinner. I am often given to forgetfulness and you have got to sympathise with me for that."

"Then how did you remember it again?"

"Though I forget, yet something or other I see or hear reminds me of it in time to save me."

"Then how was it in this case?"

"I was sitting there and people were parading the pavement. One of

them, you now, was a very charming girl, and strange to say she reminded of the dinner."

"A friend of yours, I suppose, who knew that you had this engagement."

"I really wish she were my friend. But quite a stranger to tell you."

"I don't follow you, to tell the plain truth" said Mrs. Krishnamoorthi.

"How can you unless you hear me to the end."

"Then why not you tell it?"

"Now by the bye what did I tell you."

Mrs. Krishnamoorthi lost her patience and said "You said that a very charming (emphasised the two words, for women cannot bear to hear others than themselves being called very charming) reminded you of the dinner. And you also told that that winsome angel is not your friend and I asked you how was it she reminded you of this dinner. Now do you remember?"

"Y...e...s I do. When I saw her face something there reminded me of the dinner."

"What was it? you always take a cruel pleasure in keeping others in suspense."

"Not in the least. If people are impatient I cannot be blamed."

"Alright let it go. What about the thing I asked you?"

"As I told you before something in her face reminded me of the dinner. She was a very charming girl, you know, and as an admirer of human beauty...."

and Mrs. Krishnamoorthi put in "rather say feminine beauty."

"Yes, as an admirer of, as you say, 'rather feminine beauty'. I was lost in my admiration for her. And she stood for some time to see the moon rise. When I was looking at her, all a sudden, I saw two tiny dinner gongs hanging at the ear lobes, and this dinner flashed through my mind."

"Right o! then let us off our hats to the dinner gongs" said Mr. Krishnamoorthi.

"O. K. "



Photo of lithopædeon removed from the rudimentary horn of the uterus (enlarged).

A Case of Pregnancy in the Rudimentary Horn of the Uterus.

(From the Wards of Dr. A. L. Mudaliar, Second Obstetrician, Government Hospital for Women and Children, Egmore.)

REPORTED BY S. G. RAJAGOPAL, FINAL YEAR.

Name.—Parvathi Amma; age, 17; caste, Hindu; admitted on 30th October 1938. At the end of one month the symptoms subsided.

Complaint.—Tumour in the lower abdomen of two months' duration.

Previous history.—Married since 2½ years, children nil. Abortions nil.

History of present complaint.—Periods regular till 11 months ago. Present complaint started following five months of amenorrhœa during which time, all symptoms and signs of pregnancy were present.

During the sixth month as a result of lifting some heavy weight, patient got a severe attack of abdominal pain and backache, and passed a few bits of urine per vaginum. The patient was feeling very weak and had a rise of temperature. There was retention of urine and constipation. After 10 days, the intensity of the pain was a little less, but there still was a continuous dull pain in the lower abdomen. The temperature was high, ranging between 101° and 102°. Retention of urine and constipation were present and were relieved by repeated catheterisation and enemata. During this time patient was treated with injections of pituitrin, eserine, and aolan, and turpentine stupes and

tonics by mouth. At the end of one month the symptoms subsided. In the seventh month, the patient had bleeding for 4 days (resembling her monthly periods) with no pain. The patient was confined to bed. During the eighth and ninth months also, there was bleeding for 4 days also with no accompanying pain. In the tenth month there was no bleeding. Thirty days after the ninth month, patient was admitted into this hospital and was treated with injections of œstroform. There was no bleeding and no pain. After two weeks of treatment, the patient was discharged, being advised to come back, if she had any bleeding.

But, three weeks later, she came back and had had no periods, the probable date of her period during the eleventh month being exactly a week ago.

From the fourth month, the uterus had not shrunk in size, and no pain was present but for a certain amount of tenderness in the lower abdomen on both sides, where now there is a hard palpable mass.

Present condition.—Patient is ill-nourished, slightly anæmic. Temperature normal. General condition fair.

Heart.—A soft systolic murmur heard in the pulmonary area. Otherwise nil abnormal.

Lungs.—Nil abnormal.

Abdomen.—Flaccid, a hard irregular mass palpable in the lower abdomen, extending from the hypogastrium to the right iliac fossa. Foetal parts felt as if just under the abdominal wall.

P.V.—Cervix directed downwards and backwards is closed. Uterus anteverted. Left fornices clear. In the anterior fornix there was fullness which was extending also into the right fornix.

Blood.—R. B. C.—2,500,000 per c.mm.
W. B. C.—4,010 per c.mm.
Hb index—48 per cent.

Urine.—Clear. Sp. gr. 1014, faintly alkaline. No albumen and no sugar. Deposit—plenty of pus cells and bladder epithelial cells and a few R. B. C.

X-ray.—Shows parts of foetal skeleton, especially the spine.

Operation by Dr. A. L. Mudaliar. Abdomen opened by a median sub-umbilical incision. The peritoneal cavity was opened by a similar incision, and it was found to be full of adhesions in the lower part and so the incision had to be extended to above the umbilicus. On exploration the omentum was found adherent to a mass on the right side which on investigation was found to be a rudimentary horn of the uterus. Gestation had occurred in this rudimentary horn which subsequently had developed to a lethopœden. The sac was of the size of a husked coconut and in it, were the remnants

of a foetus showing all the bones of the limbs and skull forming a rather soft mass. (See photo on facing page).

The sac was adherent all round and especially to the bladder and omentum and intestines. These adhesions had formed a false sac all around. On separating the adhesions, the little sac was found to be deficient in one portion where a bit of soft degenerated placenta presented itself.

The mass was enucleated and on further investigation the round ligament on the right side was found to arise from the corner of a small uterus—the ligament of a rudimentary horn. The tubes and ovaries were attached to the lateral end of the rudimentary horn and on the left side they were attached to the left corner.

A remnant of this rudimentary horn and the ligamentous attachment of it to the uterus were excised in a wedge shaped manner, and the broad ligament reconstituted with silk sutures. There was a small cyst in the right ovary which burst spontaneously during manipulation.

There was a little hæmorrhage from the raw area caused by the separation of adhesions, this was controlled by a pack. The area was mopped cleaned and the abdomen was closed in layers with sutures and clips.

The patient had an interrupted convalescence, the wound healed by first intention and the patient was discharged cured on the 17th day.

I am thankful to Dr. A. L. Mudaliar for permitting me to report this case and to Dr. K. K. Thampan for helping in preparing this case report.

The Madras Medical College Magazine.

NEW YEAR HONOURS.



WE heartily congratulate Major-General N. M. Wilson, C.I.E., O.B.E., I.M.S., the Surgeon-General, and Rao Bahadur Dr. M. R. Guruswami Mudaliyar, M.D., Consulting Physician to the Hospital on the honours conferred on them by the Government.

THE PROBLEM OF CRIPPLES IN INDIA.

There are no special centres of work in this province except the Medical College Hospitals where special work could be carried out.

There are several hospitals in the United Kingdom entirely devoted to Orthopædics.

The provision of bed accommodation in this province is extremely inadequate; further even the people are not availing themselves of the available opportunities at least.

Unqualified practice still prevails a great deal; village potter in this City itself is the bone-setter; several other people have been exploiting the public successfully on "Bone-setting."

Ever since the Great War 1914-18, Great Britain has made ample provision for orthopædic centres

in all Counties and Districts. Rehabilitation centres for the injured are now scattered all over England. Great thought and attention have been spent on their organisation. The private munificence of Lord Nuffield has encouraged the looking after of the cripples in the United Kingdom on a liberal scale. Orthopædic clinics are run in connection with school medical and infant welfare services; rheumatic centres have been developed in various parts of that country.

The international association for the looking after of the cripples has done a great deal in other countries and Lord Nuffield has given liberally for the cripples.

The Social Security Act (1935) of the United States of America in 1935 alone provided (A) 2,850,000 dollars (£570,000) for ascertainment, education and treatment of cripples on the lines established in New York State since 1916 and similar to the system in England, (B) 1,900,000 dollars (£380,000) for vocational training, i.e., for the restoration of the working capacity among the disabled.

In other countries orthopædic associations exist, special interest is taken in the study and practice of the subjects by post-graduate courses, degrees, clinical assistantships, research scholarships

grants. Journals of bone and joint surgery are published and the British Medical Association has organised a Special Section for discussion of the problems. There is a British Orthopædic association and Rheumatism association with journals and conferences.

The literature available in India is indeed very scanty on the local every day problems, or on case reports of ordinary or rare cases. Even important Libraries do not stock the various Indian Medical Journals.

One of the great needs of to-day, in making possible the cure, relief, and education of crippled children,

is to give to the general public and the medical profession an understanding of the immensity and peculiar nature of the problem.

The nurse, mother, social worker, and agencies of Societies for cripples should know the causes which produce the crippling conditions in children and should become interested in their prevention and early treatment. In this province, under the existing finances, it will remain the paramount duty of the medical and the nursing profession to urge for the proper treatment and cure of cripples or to fight single-handed with groups of cases or isolated cases.

Personal.

A Correction.—The correct designation of Lt.-Col. W. C. Paton, I.M.S., according to Government Order, is "Professor of Midwifery".

Rao Bahadur Dr. S. Ramakrishnan is the Vice-Principal of the Madras Medical College.

Lt.-Col. P. Verdun, I.M.S., to be the Superintendent of the Ophthalmic

Hospital and Professor of Ophthalmology.

Dr. D. Subramaniam, M.S., has left for England on leave for higher studies.

Dr. K. N. Krishnan, Assistant to Professor of Physiology has rejoined his appointment.

Extracts.

"INDIAN MEDICAL REVIEW"

By the Director-General, Medical Services, India.

The "Indian Medical Review" is a publication just brought out, which gives, for the first time, in a compendious collection useful information bearing upon the science and practice of medicine in India, and the facilities available for training and treatment.

While the Central Government has responsibilities for medical research, port quarantine, higher medical education, and for medical and health affairs of areas under its direct administrative control, medical and health subjects are the concern of the Provincial Government. Despite the fact that there are numerous hospitals and dispensaries in the country, rural areas are still without adequate medical provision. Want of adequate funds is, no doubt, the principal cause to which the existing state of affairs may be attributed, but absence of reliable means of communication and disinclination of the qualified medical men to settle in rural areas is also another reason.

sional man, who has passed successfully through an arduous and prolonged scientific education, is not generally willing to reside in a remote country area, where amenities are few and earnings meagre.

Provincial Governments are doing their best to lessen as much as they can the sufferings of the millions living in villages. Medical men are being encouraged to settle in rural areas. They are being given subsidies for the purpose and are allowed private practice. Rural medical relief is at present afforded through the agency of fixed and touring dispensaries, subsidized medical practitioners, unqualified village schoolmasters, practitioners of indigenous systems of medicine and Missionary doctors.

Advisory Committees for hospitals function in almost all provinces. Their activities are confined to give advice and making suggestions and also to looking after the welfare of the patients, the Committee thus forming a very useful liaison between the Government and the public.

Disinclination to settle in Villages.

This disinclination of the private practitioner to settle in rural areas is not peculiar to India, but is common to all agricultural countries. A profes-

Hospital Service.

The following is a tabular statement of the average area and population served by hospital or dispensary:—

Provinces.	Total number of hospitals and dispensaries in Province.	Average area served by each hospital or dispensary. (sq. miles).	Average population served by each hospital or dispensary.
Madras	1,134	126	41,217
Bombay	429	180	41,940
Bengal	1,449	540	34,585
United Provinces	597	178	81,087
Punjab	896	111	26,318
Central Provinces	343	291	45,212
Bihar	528	131	61,310
Assam	343	160	25,138
Sind	108	429	35,991
Orissa	164	145	32,355
Delhi	24	24	26,510
North-West Frontier Province	114	118	21,272
Baluchistan	41	1,327	11,305
Ajmer-Merwara	10	371	56,029
Coorg	11	145	14,848

Expenditure on medical relief in the various Provinces was as follows:—

Provinces.	Expenditure on Medical Relief during 1936.	
	Per Capita. Rs. A. P.	Per Square mile. Rs. A. P.
Madras	0 2 7	53 2 5
Bombay	0 4 9	65 7 0
Bengal	0 2 1	84 0 0
United Provinces	0 1 0	29 0 4
Punjab	0 5 7	51 12 9
Central Provinces and Berar	0 1 5	13 11 10
Bihar	0 1 3	35 11 8
Assam	0 1 8	14 5 5
Sind	0 4 0	20 15 3
Orissa	0 1 6	23 5 8
Delhi	1 2 5	1,272 0 0
North-West Frontier Province	0 6 3	70 0 0
Baluchistan	0 8 8	4 9 9
Ajmer-Merwara	0 4 11	63 0 10
Coorg	0 11 2	71 9 7

The total number of beds available for maternity cases in the various provinces during the year 1937 was about 8,000.

As against this, nearly three million women are disabled temporarily or permanently every year as a result of pregnancy and labour, while maternal deaths arising out of pregnancy number over 160,000 and the tragedy is that probably 80 per cent of these deaths were preventable.

X-ray facilities are also by no means adequate, there being in India only 83 major and 47 minor sets in the hospitals reported on.

Facilities for radium treatment exist to a very limited extent, the total quantity of radium available being about 5,131 m. gms. available only in Madras, Bombay, Bengal, Punjab, Bihar, Assam, Orissa and Delhi, besides the small quantities in the hands of the private doctors.

Free Treatment for the Poor.

Poor and indigent patients, both indoor and outdoor, are given free medical and surgical treatment in all provinces in India.

A complaint frequently made against the administration of Indian

hospitals, is that large number of patients who can really afford to pay are treated free of charge. The problem is not simple, because modern scientific medicine is costly, and although a person may not be indigent as regards the ordinary necessities of life, he often is in respect of even minimum requirements when sick. On the whole the revenue obtained from the payments of ordinary patients, says the Director-General, is not large, but fees paid by patients occupying private or paying wards should cover the cost to Government or the Hospital Management and in general do so.

Few private Nursing Homes exist in India, except in Calcutta, Madras and Bombay. In Bombay a legislation on the lines of the Nursing Homes Registration Act of Great Britain to provide for registration and inspection of Nursing Homes is under contemplation. When passed into law this should considerably improve the situation.

Nursing in India.

There is considerable dearth of the right sort of material for training as nurses. The caste Hindus have for decades looked with disfavour upon nursing as a profession, though the prejudice is slowly breaking down.

Since 1934 a considerable change has taken place in the outlook of the Central and Provincial Governments. Nurses' and Midwives' Registration Acts have been passed in Madras, Bengal, United Provinces, Central Provinces, Punjab and Bihar.

In practically all the nurses' training schools in British India, the three years' period of training for nurses has been adopted and most hospitals

work very closely on the comprehensive syllabus laid down by the Central Nursing Council of England and Wales. Where this syllabus is adopted, there are two examinations. The preliminary one can be taken at any time after the completion of one year's training, but is usually taken at the end of eighteen months and the final one on completion of three years' training.

Indigenous Medical Systems.

For some time past there had been a demand from the public of the Bombay Presidency for the recognition by Government of the Ayurvedic and Unani systems of medicine. There is accordingly now under consideration in the Bombay Legislative Assembly, a Bill which provides for the establishment of a Board of Indian systems of medicine and for the recognition by law of certificates given by registered practitioners of these systems. The Board is to prescribe the course of training and qualifying examinations, and no person shall be eligible for registration unless he has passed such an examination.

The Madras Government have already given a certain amount of recognition to the practitioners of the Indian systems of medicine, by appointing holders of the diploma in medicine of the Government Indian Medical School, Madras, as subsidized medical practitioners in rural areas.

The Punjab Government have appointed a committee to suggest means by which necessary protection can be given to such practitioners.

The United Provinces contemplate adopting a system of Vaid and Hakims, and a scheme for subsidizing Vaid and Hakims is under consideration.

Medical Training Facilities.

Medical Colleges built at Government expenses were established in India at Calcutta and Madras in 1885, but it was not until 1906 that the need for higher teaching of a university standard was generally recognised. There are now ten University medical colleges, including one exclusively for women, established in India, while post-graduate training is imparted at the School of Tropical Medicine, Calcutta, the All-India Institute of Hygiene and Public Health, Calcutta, and at the Malaria Institute of Karnal.

While the Lady Hardinge Medical College, New Delhi, is meant exclusively for women students, in most of the other colleges, a few seats are reserved for women, and there are 322 such students at these other colleges.

Though at the Lady Hardinge Medical College, Delhi, students are admitted from any part of India, at other medical colleges seats are primarily reserved for local candidates. This provincial preference means that students of many areas cannot obtain a higher medical education in India. Residents of Indian States, Central Provinces, North-West Frontier Province, Delhi, and the centrally administered areas are especially affected, and the time has come, says the Director-General, Indian Medical Service, when the establishment of a new medical college in Delhi or at some other central place must be seriously considered.

Plea for High Standard.

The first medical school in India was established in Calcutta in 1822. There are now 18 Government and nine non-Government schools in British India, training a class of medi-

cal men and women known as Licentiate or Sub-Assistant Surgeons. Several schools began as Unani and Ayurvedic teaching institutions, but all of them have abandoned this system.

The considerations, says the Director-General, which have prevailed so far in continuing the licentiate course of studies no longer exist. Higher scientific education has become popular and there is not likely to be any dearth of well-qualified candidates for admission to the Medical Colleges. The time has, therefore, arrived for adopting a uniform standard of medical education. The Government of Madras have already decided that with effect from 1938 fresh admissions to the Stanley Medical School, Madras, and the Lady Willingdon Medical School for Women, Madras, should be stopped. The former institution will be converted into a medical college for men and women.

Standardizing Medical Education.

The Medical Council of India was brought into existence by the Indian Medical Council Act of 1933, which placed on it responsibility for the maintenance of a uniform minimum standard of higher qualifications in medicine for the whole of British India. The Council carried out a detailed inspection of all the Indian Medical Colleges and their examinations, and as a result the medical qualifications of all the Universities, except those of the Andhra University, have now been reorganised.

The Medical Council of India has also framed a series of recommendations for professional education, which now govern the requirements and standards of University medical education in India.

Profession of Pharmacy.

A close study, says the Review, irresistibly points to the pressing need for immediate improvement of the situation in regard to the profession of pharmacy in India and to the manufacture, sale and import of drugs included in the British Pharmacopoeia as well as of those which are known and approved.

Both Bengal and Madras have instituted advanced courses in Pharmacy, but they are not popular, mainly because the prospects for future remunerative employment are meagre. The probable solutions, says the Director-General, would be to insist upon a reasonable standard of general education, such as is guaranteed by passing the Matriculation examination of an Indian University, an adequate course of training, including apprenticeship of not more than 9 to 12 months, and properly organised Provincial examinations.

—*The Hindu*, November 3, 1938.

AMBULANCE WORK AND STUDENTS.*Surgeon-General's Appeal.*

MADRAS, Nov. 6.

A Division of the St. John's Ambulance Corps for the students of the Stanley Medical College, Royapuram, was inaugurated by Major-General N. M. Wilson, Surgeon-General with the Government of Madras, this morning, at the College premises.

Though he was in their midst as Surgeon-General, Major-General N. M. Wilson said, his real object in being there was not for any purpose as Surgeon-General but as the Chairman

of the St. John's Ambulance Association of this presidency. Their Principal and himself were of the same opinion that it was necessary to form or encourage this work of the Ambulance Association in this new College. He was very much interested in this work because he had realised that the people of India were all out for social work and there was "no finer form of social service than looking after the sick and the wounded."

Eight and a Half Centuries Old.

Speaking about the St. John's Ambulance Association, Major-

General Wilson said that the Association was 839 years old and was the oldest medical association in the world. It was started not by a Britisher but by a Frenchman named Gerrard, during the wars in the Middle East in which France, Britain, Spain, Italy and other countries were involved. In those days there were no medical arrangements for the sick and the wounded in the battlefield. But in Jerusalem there was a hospital founded in the year 600 A.D. which gave some sort of treatment to the sick. It was only in 1099, many years afterwards, that Gerrard came across this hospital, dedicated to St. John, and he went to the hospital and asked them if they would take in the wounded after the battle. As far as they knew, that was the first organisation of what they now knew as Field hospitals or Base hospitals. Gerrard encouraged all the wounded soldiers to go there and it soon became popular. So, that was really the first beginning of the Order of the Hospital of St. John of Jerusalem. "Our King-Emperor is the sovereign head of this order. Our Princes, not only of the Royal family in Britain but most of our ruling Princes in this country are Knights of this Order. It is not a Christian Order; but it is an Order whose chief object is to give succour to the sick and the wounded. Our work is never sensational or even conspicuous; but its value is great and is appreciated by those who pass through our hands. Our object is to work for the sacred cause of humanity and our reward is the knowledge that we have done our best.

"Why I am so keen that you all should belong to this Order is that I feel that it is primarily a Medical Order and that if we are going to build this Association up in this Province, our foundation must un-

doubtedly be the medical profession, because we are in a position not only to administer to the wounded and the sick but we are in a far better position to teach the common people of our province how to look after the sick."

Pointing out the carelessness with which the wounded were looked after in the country in cases of accidents, Major-General Wilson said this was mainly due to ignorance. He came across, he said, a case of a motor accident in which a man had cut his artery in the hand and was profusely bleeding. There were ten or fifteen people standing round him and doing nothing. By chance he passed that way and by tying a kerchief at the elbow he was able to stop bleeding. "Any cooly", he added, "who happened to be educated in the various points regarding the control of hæmorrhage would have been able to do what I did. The Police, I regret to say, are more interested in finding out the number of the car or whether the driver had licence or not. (Laughter). This did not happen in this presidency. I reported this matter to the Inspector-General of Police who was very annoyed about this. He took immediate steps and passed orders that every constable in the force should go through the course given in the St. John's Ambulance curriculum. It was two and a half years ago and I am very glad that every constable in the Central Province has got to have his certificate of first-aid."

Continuing, Major-General Wilson said that when he was the Inspector-General of Civil Hospitals in the Central Provinces he addressed the students of the Nagpur Medical School on this subject and it was gratifying to note that every student immediately joined the Ambulance Association. When Col. Sleeman came to

India and inspected that Division he said that it was one of the finest divisions he had ever seen in India. In medical students they had the finest material for the work and when they qualified themselves as medical men and went out to mofussil places, they would be imbued with a spirit of giving help and succour to others.

Must be prepared for any Eventuality.

"At this period of our life, the whole world is upside down. We do not know where we are at present. We have no medical organisation in Madras or anywhere in the presidency that could cope with any catastrophe, be it an act of God or an enemy", Major-General Wilson continued. Referring to the earthquakes of Quetta and Bihar, he pointed out how medical aid had to be rushed from outside places. They never knew what would happen to Madras. They might be thinking that an earthquake would not occur in Madras. The people of Bihar also thought the same thing. But another danger that threatened them was war. Let them look at what was happening in Spain. More women and children had been killed in the Spanish Revolution than men. This was due to bombing aircrafts that indiscriminately flew all over the place and dropped their "death charges." The Japanese were bombing Canton and other areas. They were probably hoping thereby that people would sue for peace. That was apparently the new method of waging war. Such a thing might not happen in Madras. "But we would be wrong if we are not prepared for any eventuality as war." He felt that if they had units like the Stanley Medical College Division, they would immediately "form in" and would be given opportunities for bandaging people,

getting them out of debris and that sort of thing.

After congratulating the students for the splendid response given by them, Major-General Wilson said, "I feel certain that other colleges throughout the presidency will quickly follow your lead and it would be one way of stamping your college as second to none, though it is a new college." (Cheers). He was told that the students were upset because they had to sit for an examination. He might tell them that they could pass it with the greatest ease. The third, fourth and fifth year students might read the necessary books during leisure hours and appear for the examination. Once certificates were granted they would be in a position to form Divisions. Lady students, who would soon be doctors, appeared to dislike being formed into what was called a "Nursing Division." He might tell them that though they were called Nursing Division, they would not be used as nurses. In the case of a catastrophe in which so many women and children might be injured, they would be sent to various units known as temporary hospitals to look after the wounded women and children. They would be utilised for the purpose of dressing wounds, and probably for administering anæsthetics and be taken as house surgeons. The only way of getting at them in case of an emergency was by getting them together into a Division. After all, though they might have to go through a small course of nursing, it would not do either men or women any harm. It was very necessary that a doctor should know how to make a bed, how to put in a draw sheet and how to make the patient comfortable. When they went to mofussil places for practice, they could not expect to have trained

nurses around them. They would have to do a good deal of nursing themselves and they would have to instruct the relatives of patients how to make them comfortable. Therefore, this

training for their certificate would not do them any harm but on the other hand it would make them in the end very good doctors. (Cheers).

PUBLIC HEALTH RESEARCH.

NEW DELHI, Dec. 13.

Vital problems affecting India's health were reviewed at the Sixteenth Annual Medical Research Workers' Conference which was opened by the Hon. Sir Jagdish Prasad, Member for Education, Health and Lands in the Conference Hall of the Imperial Secretariat, New Delhi, yesterday.

An unusually large number of medical and health interests were represented including administrative heads of Medical and Public Health Departments, distinguished members of the women's medical profession, representatives of the Indian States military health services, railway medical organisations, the Rockefeller Foundation, Research, and others.

Sir Jagdish Prasad's Address.

The Hon'ble Kunwar Sir Jagdish Prasad, in the course of his address, said:

"Till last year, this Conference was held always in Calcutta and to some extent, therefore, functioned in a restricted orbit. I hasten to say, in deference to the feelings of any Calcutta persons present, that I do not consider that great city a restricted spot in itself; what was in my mind is that the continued association of your Conference with a single city in India had prevented the people of Northern India, for example, from having the aims and scope of medical research work in India

brought more closely home to them. I think it has been a great benefit to have had it brought to Delhi, and I would be glad in due course if it could go the rounds of the main centres in India where those of your profession could conveniently gather and where they would find an appreciative local audience and co-operation.

"As you are probably aware, the Research Fund Association was founded in 1911 through the foresight of the late Sir Harcourt Butler, the first Education Member of the Government of India and one of the greatest Governors under whom it has been my good fortune to serve. He did many big things in a big way, and not the least of them was the foundation of this Association. Let us cherish his memory in grateful remembrance.

Training of Workers.

"The Association has produced one remarkable result during the comparatively short period of its existence", continued Sir Jagdish, "namely, the training of a large number of Indian research workers of proved competence. Out of one hundred and six research workers paid by the Association no less than one hundred and three are Indians. In the Medical Research Department of the Government of India sixteen officers out of twenty-five are Indians. Research, therefore, is now predominantly in the hands of Indians, and they are the inheritors of a great

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tradition. Medical research in India has many achievements to its credit, specially the notable contributions it has made to our knowledge of kala-azar, malaria, plague and cholera. While we are proud of our achievements we cannot yet say, as for instance it can be said of England, that cholera, typhus, typhoid, plague, smallpox and malaria have been stamped out.

"In my view nothing is more likely to stimulate public opinion and to make it realise the extent to which organisation under scientific direction can be effective, than the eradication or control of even a single disease in a specified area. If we can free even one infested town of, say, malaria, we will have made a great advance in the education of public opinion.

Need for Public Benefactions.

"Without the aid of public benefactions I fear that with our present financial resources, the provision for medical research must remain inadequate for many years to come. In comparison with Western countries our expenditure on research is meagre and there seems little prospect of improvement in this respect in the near future. At the same time I fully recognise that it would be shortsighted policy if violent budgetary oscillations were to result in throwing out of employment a number of workers engaged in important work and in the prime of their powers. Such a policy would indeed give a serious setback to research in India and will, I hope, never find favour.

"While I am on this subject of research I should like you to remember that in a poor country like India it is not enough to discover a remedy. If it is to be widely adopted it must be

within the means of the Government and peoples to apply. To give an illustration, the efficacy of quinine in the treatment of malaria is recognised. We all know, however, that at present prices quinine can be used by only a very small fraction of the population. Research must, therefore, continue into remedies—both preventive and curative—which may be within the financial resources of the country. In India the research worker cannot ignore the economic conditions of the people for whom his researches are primarily meant.

"It will be generally admitted that some of the fundamental causes that produce ill-health such as poverty, overcrowding, defective sanitation and water-supply, evil social customs and ignorance of the laws of health, are outside the immediate field of your work. Your primary concern is, I take it, with the causation, prevention and cure of human diseases. Your object is to save human life and to alleviate human suffering, in contrast to some researches in other realms of science where new discoveries seem to threaten the very existence of civilisation as we know it.

"I do earnestly pray that no diabolical ingenuity may ever pervert the discoveries of medical science to the destruction of mankind. It is my earnest hope that by your continued researches you may place at the disposal of the men and women of this country and of their Governments powerful weapons with which to destroy the long and desolating supremacy of disease and preventible path in this country and to secure for the people of India the inestimable blessings of health and physical fitness."

General Bradfield's Review.

General Bradfield, addressing the delegates, said he joined with the Hon. Member for Education, Health and Lands in extending to them all a hearty welcome to Delhi.

Drain on Capital.

In discussing the affairs of the Indian Research Fund Association, its research activities during the present year and its plans for the coming year, he felt it, he said, to be his duty to bring to their notice at once that contrary to expectation, the financial position of the Association, which had been a cause of anxiety to both the Governing Body and the Scientific Advisory Board for some years, had not improved. Since 1932 the activities of the Association had been maintained at their present level only by drawing on capital funds, because the Government of India had been unable to give an annual grant larger than Rs 1,50,000, compared with its previous grant of Rs. 7,50,000. It was hoped that this drain on the capital of the Association would be appreciably reduced during 1938-39 by the Government of India undertaking responsibility for the Public Health Section of the Malaria Institute of India. Unfortunately this hope had not materialised and the Governing Body had been compelled to draw further on its capital to the extent of Rs. 4,50,000. These facts were mentioned, the Director-General continued, so that they would appreciate the necessity for close scrutiny of the proposals for next year's programme.

The number of enquiries being conducted this year, explained General Bradfield, was 63 compared with 53 in 1937-38 and with an average of 38 during the five preceding years. Applications had been received for the

continuation of 56 enquiries for the inauguration of 22 new enquiries, or 78 in all. The grants given during the present year, stated the Director-General, numbered 42 to laboratory enquiries and 20 to field enquiries. Nineteen of the enquiries were in medical colleges or schools.

Nutrition Research

Turning to nutrition, General Bradfield said that further progress had been made during the year. A training course for health officers in public nutrition work, including methods of carrying out diet surveys, was held at the Nutrition Research Laboratories, Coonoor, in February and March last. The important Conference of Far Eastern countries on Rural Hygiene held in Java in 1937 recommended the establishment of a National Nutrition Committee in each country. The Government of India had accepted this recommendation and had decided that the Nutrition Advisory Committee of the Indian Research Fund Association should perform the functions of a National Nutrition Committee for India.

The value of the work done under the auspices of the Association in the matter of nutrition and the high esteem in which the Association's Nutritional Laboratories at Coonoor were held by Eastern countries, had been indicated, continued General Bradfield, by a request from the League of Nations Health Committee that the Coonoor Laboratories should assume the task of co-ordinating nutrition research in the East. This request would come before the Governing Body for consideration at its next meeting.

Last year he had made a brief reference to the danger of the introduction of Yellow fever into India owing

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to the rapid development of air transport. Colonel Russell had visited Egypt last spring and later in the Conference would give them a description of the present epidemiological features of this disease and the preventive measures now taken in this country against possible introduction of infection.

During the year an International Conference on Leprosy had been held at Cairo and India had sent seven delegates. The report of that Conference went to show that the anti-

leprosy work in India had been planned on sound lines.

General Bradfield concluded by impressing especially on the younger workers that, when choosing a subject for research, they should always keep in mind the importance of its applicability to the improvement of the health of the people in India. This must always be a primary consideration with the Scientific Advisory Board in making their recommendations to the Governing Body. He was confident that their discussions this year would be equally helpful and stimulating.

FOOD CONTAMINATION FROM VESSELS.**HEALTH MINISTRY'S PRESS NOTE.**

The Government have issued the following press communique, giving information to the public regarding contamination of food through vessels used in Indian households :

The Government consider that the following information regarding the contamination of foods through vessels will be of use to the public and they accordingly publish it for general information :—

Vessels for storing and cooking food form an important equipment in an Indian household. The vessels generally used are : (1) earthenware and soapstone, (2) porcelain and enamel, (3) glass and (4) metallic.

Earthenware and Soapstone Vessels.

Vessels made of earthenware are not only the cheapest but most hygienic. Practically they are unaffected by exposure to air or to the process of cooking. They do not, unlike metals, enter into chemical combination with the food elements and deprive the food of

its flavour. The only disadvantage is that these are easily breakable and require thorough and careful cleaning as the pores are not readily accessible. After use they should be thoroughly cleansed and exposed to air and sunlight for drying till they are again required for use.

Porcelain and Enamel Ware.

Porcelain is not suitable for heating purposes. Regarding enamel wares, only the better and costlier variety should be used. The glaze or outer white or coloured coating of these vessels sometimes contains fluorides and oxide of antimony which are poisonous. Fluorides give rise to teeth troubles.

Glass Vessels.

These are not suited to our conditions. They break easily leaving sharp edges which would be a source of danger especially to children. If these break, people should see that they are all collected carefully, especially the small particles, with a wet towel, and thrown into public dust-bins or in a place far away from human habitation.

Metallic Vessels.

As far as possible every one should use only the minimum number of metallic vessels. Metals are all liable to corrosion, *i.e.*, they are transformed on exposure to air and water into different chemical substances. These are more readily attacked by the food or water with which they come in contact. Under the conditions of cooking, the metals themselves may rapidly go into solution in the food. The salts so dissolved might act injuriously on the health. However, if the metal surface is kept quite bright and polished it is less liable to be attacked by the food constituents. The South Indian method of giving a coating of mud or starch before they are placed on the hearth for cooking and also the practice of cleaning first with a coating of tamarind and then scrubbing with ashes, are based on scientific principles and should be adhered to.

Lead Vessels.

Of all the metallic vessels those that contain lead are the most insidiously poisonous in character and consequently to be eschewed altogether. In the southern districts of this Province, especially in Tanjore, Trichinopoly and Tinnevely, women vie with one another in getting as many of these lead vessels (familiarly known as 'Iyya chombu') as possible. These, though supposed to be made of tin, actually contain lead in varying quantities. Lead salts are poisonous and some of them formed in the process of cooking especially soups (sambar, rasam and the like) in lead vessels impart a sweet taste. Lead salts are cumulative poi-

sons. Their baneful effects are not produced at once. They are not thrown out of the system but begin to accumulate little by little and ultimately are locked in the tissues and when sufficient quantity has collected, cause anaemia, constipation, stomach pain and a host of other ailments.

Copper, Brass and Tin Vessels.

These, if kept clean, serve well for storing and transporting water, but copper and brass are not to be recommended for cooking purposes. Milk, if boiled in copper vessels, loses its flavour and is deprived of part of its vitamin A. Brass vessels intended for cooking rice are generally given a tin coating. For reasons stated above, the tin should be quite free from lead. Further tinning of vessels is ordinarily delayed till the tin coating is peeled off. The corrosive action with such a pitted surface is considerably increased and more of the metal is likely to be dissolved by food juices. It is essential that tinning should be done at very frequent intervals to avoid this possibility. Besides, tinkers generally add lead or zinc or both in tinning for the sake of cheapness and easier workability. These are poisonous and consequently the tinkers should not be allowed to use their own 'tin' for this purpose.

Aluminium Vessels.

These can be used for boiling milk and water. Generally speaking aluminium is the least toxic of the metals commonly used. If used for cooking especially in presence of salt and tamarind they are rapidly attacked and lose their lustre which cannot be restored.

THE MEDICAL PROFESSION.**IMPROVING THE INDIAN SYSTEM.**

The fact that scientific medicine has a very short history in India and the

problems in the way of its expansion were touched upon by Major-General Sir Cuthbert Sprawson.

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Sir Cuthbert commented on the disunity of the profession.

Dealing with the question of whether India should give free medical attendance to her sick poor, Sir Cuthbert Sprawson said that the best way of getting doctors to work in the villages seemed to be to give them a subsidy. The system worked well in the Madras Presidency and there was no reason why it should not work elsewhere. During a recent visit to Russia, he had been impressed by the rapid strides they were making there. There were 141,000 students in the medical schools of whom half were women. The young graduate was induced to serve in a rural area by giving him special pay or a motor car or a cow. This might be tried in India. "In my opinion," the speaker added, "the provision of medical aid, to remote parts has never been undertaken with sufficient resolution by local governments that has progressed at all in this direction is the Government of Madras."

Speaking of the indigenous Indian systems of medicines, Sir Cuthbert said that research on Indian drugs was being done by Colonel Chopra and others. If there was anything of value in them they would find a place in the materia medica. The reason for the popularity of hakims and vaidas was that they were so cheap. The remedy lay in the proposals of the Pharmacy Committee. The cost of good drugs must be reduced by growing medicinal plants within the country.

The subsidy system had been introduced when he was in the Secretariat

of Madras and was working well. But the real solution was to raise the standard of living of the whole countryside and also to tackle the population problem.

Colonel Proctor, Dean of the London Post-Graduate Medical School, said that the Indian masses had no faith in scientific medicine because they were not in contact with it. Indian colleges were ill-equipped and had no adequate nursing staff. Rural medical relief being out of the question now, they should at least try to raise hospital standards.

Dame Edith Brown said that there was a great need for women doctors in India. There ought to be 14,000. The licentiate course should not be abolished but it might be made more practical to meet the needs of the village worker.

Sir John Megaw agreed that the medical courses for licentiates were too comprehensive. India might take up the slogan of three acres and a cow for rural workers. The speaker was wrong in saying that Madras was the only progressive province. The Punjab system of free dispensaries was successful.

Dr. Bhat remarked that in the United Provinces the subsidy system had been a failure. He suggested that promising medical students should be given scholarships on condition that they worked for several years in the districts.—*The Hindu*.

FIGHT AGAINST TUBERCULOSIS.

Need for Village Organisations.

APPEAL BY LADY MAJORIE
ERSKINE.COMPULSORY INSURANCE SCHEME,
Madras Archbishop's Suggestions.

MADRAS, Nov. 16.

The formation of a net-work of voluntary village organisations to develop the ideal of self help especially in relation to the care and promotion of public and personal health was suggested by the Lady Marjorie Erskine, presiding over the annual meeting of the National Health Association of Southern India, held last evening, at the Banqueting Hall. The meeting was largely attended.

"I am pleased to be able to preside once again" Lady Marjorie Erskine said, "over the Annual Meeting of the National Health Association of Southern India. Owing to unavoidable causes I could not be present on the last occasion and I was happy that the Hon. Dr. Rajan, Minister for Public Health, was good enough to occupy the Chair and offer valuable suggestions to increase the usefulness of the Association. I have no doubt you have been trying to give effect to his proposals.

"Since its inception the Association has been strenuously attempting to carry on an organised and continuous propaganda in the general principles and practice of personal and public health, in order to awaken the sanitary conscience of the community. As you all know and realise, miracles cannot be wrought in a day, especially when we have to combat age-long prejudices and customs. The results are bound to be slow and impercepti-

ble. But experience here and elsewhere convinces us that persistent efforts are sure to produce effects which are calculated to promote the health and happiness of future generations.

"The importance of the problems of health is bound to receive increasing emphasis in the years to come, when the impetus to the liability to disease, contributed by the rapid rise in the population, increases without a corresponding increase especially of food supply. It is computed that by the next census the population of India may reach the figure of four hundred millions. If this growing population is to be saved from the ravages of disease, the economic condition of the people should be improved, and correct ideas of healthy living should be broadcast. No effort should be spared in improving the conditions under which the poorer sections of our population live and work.

Lady Marjorie Erskine said:—

"It is needless to point out that the success of any campaign for the improvement of our population will mainly depend on our efforts to secure the co-operation of those whom we wish to serve. Once their co-operation is secured, their continued enthusiasm for the cause is assured. This will be possible by the formation of village organisations interesting themselves in all that affects the common good of the community. May I, therefore, venture to suggest to plan for the formation of a net-work of voluntary village organisations, to develop the ideal of self-help especially in relation to the care and promotion of public and personal health and sanitation? It will then be the duty of the central organisation, like our

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Association, to sustain the enthusiasm of these village leagues by constant advice and help.

Work in Advanced Countries.

His Grace the Rt. Rev. Dr. L. Mathais, Archbishop of Madras, speaking on the occasion said that he was glad to associate himself with the noble efforts that were now being made, thanks to the initiative of Her Excellency Lady Linlithgow, to combat tuberculosis. The response to the appeal of Her Excellency had been very encouraging.

A Scheme for Compulsory Insurance.

"As for raising the necessary funds," His Grace proceeded, "I do not think that the sale of one anna flags and subscriptions and donations will enable us to obtain the necessary resources to carry out such a formidable task. The amount already collected at a result of the appeal of Her Excellency Lady Linlithgow, though encouraging and is well over Rs. 25 lakhs, is obviously inadequate to combat a malady of such magnitude. If we are to make a determined effort to stamp out the disease, we require not lakhs but some crores of rupees. May I venture to make a suggestion which though it might seem rather bold especially here in India is nevertheless feasible and has proved a success in many Western countries, as for instance in Italy. Faced with such tremendous problem affecting nearly 95 per cent of the population, as I have already said, I see no reason why the Government of India and the Provincial Governments should not introduce a scheme of compulsory insurance against sickness, particularly against tuberculosis. Under such a scheme all workers could be insured or insure themselves against tuberculosis. It is hardly necessary

for me to say that this insurance, in order to be popular and successful, should be under the supervision of the Government and carried out through the Public Health Department. We can have some idea of the vast scale on which expenditure was incurred in England on anti-tuberculosis work from the fact that during the decade ending 1922, the payments from the exchequer increased from £ 0,000 in 1912 to £1,717,000 in 1922, while the total expenditure increased from £96,000 in 1912 to £3,074,000 in 1922.

"The proposed scheme of insurance should provide for clinic and sanatoria in various paces throughout the country. To make it more attractive to all the workmen not only the head of the family but also his dependents should be within the purview of the scheme. While the patients are obliged to remain in residential institutions, it will be necessary to provide for their dependents out of these funds. This can be achieved if every workman is compulsorily insured. There is no need to apprehend that the scheme will be financially burdensome to the worker. He can pay just one anna a month, twelve annas a year. This small payment will amount to a large sum annually and will swell to a much greater figure in a few years.

"If I remember right, according to the calculations of Mr. Joshi, one of our great labour leaders, in India, there are not less than five million people employed in registered factories and 30 million more in unregistered factories, workhouses and public institutions, where many are employed in inferior services. If all the 35 millions are brought within the scheme, everyone required to pay the paltry sum of one anna per month we shall have Rs. 2,62,50,000 and that every year. Thus, the amount collected in this Presidency alone may amount to

Rs. 15 lakhs per year assuming that there are about two million labourers. I could not find any statistics giving the exact number of workers in the Presidency. We work our numbers on one anna per month but the amount prescribed could also be according to the monthly wages of the workmen and vary from one anna to one rupee. The total amount so collected would be much higher still and work to several crores per year.

MENTAL HOSPITALS IN INDIA

Lack of Adequate Accommodation.

NEW DELHI, Dec. 9.

Overcrowding, with its implications of growing hardship to the patients and increasing difficulties for the institutions, is reported in India's mental hospitals.

At present there are only 17 mental hospitals in British India, three in Madras Presidency, five in Bombay Presidency, three in the United Provinces, two in Bihar and one each in the Punjab, Central Provinces, Assam and Sind. The province of Bengal has arrangements by which its mentally defective patients are admitted to the mental hospitals in Bihar. There are such hospitals in Orissa or the North-West Frontier Province.

Among States, Mysore has a mental hospital at Bangalore with accommodation for 183 males and 67 females, and Hyderabad has a small lunatic asylum in the Central Jail. A scheme for the construction of up-to-date mental hospital has been sanctioned and the construction work is to be started shortly.

"The prospects of controlling the disease thus seem to be very hopeful. Now that a great movement has been launched under such happy auspices, it behoves all of us, rich and poor alike, to all that lies in our power and make a united effort to eradicate an evil, which is the cause of so much suffering and misery to a vast number of people in this beautiful land." (Cheers).

In the 17 hospitals in British India there is accommodation for 8,425 patients, but the number of patients actually confined in these institutions in 1936 was 11,792, of which 8,939 were males and 2,862 females. There was overcrowding in almost all the hospitals, but it was more acute in Madras, Bombay and the United Provinces. The demand for admission in some hospitals was so great that even criminal insanes had to be lodged in jails where there was no satisfactory arrangement for treatment.

Psychiatric Clinics.

A greater part of the accommodation in the existing mental hospitals is occupied by incurable patients, and the only important advance made in recent years has been the organisation of psychiatric clinics at medical teaching institutions in Bombay, Bengal and the United Provinces. No such clinics exist in the Punjab, Bihar, Central Provinces and Berar, Assam, North-West Frontier Province, Orissa, Baluchistan and Coorg. Funds are not available anywhere to provide adequate accommodation for mental patients but whenever possible psy-

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chiatric clinics should be opened at the larger hospitals. Such clinics deal especially with the early curable cases and when combined with a Neurology clinic often produce the confidence which attracts patients.

Another pressing problem is the provision of separate institutions for the training of mentally defective children. In Madras a class of about 15 children, who were inmates of the Madras Mental Hospital, was formed in 1937 and instruction in sense training, simple story telling, picture drawing, etc., was given and facilities for excursions, outdoor games, amusements and certain simple cottage industries provided. In Bombay the training is given at the Byramjee Jeejeebhoy House for Children, Matunga, which is maintained by the Society for the Protection of Children in Western India. The children are taught on Montessori lines and the training includes classes on sewing, embroidery, raffica work and bead work. Mentally defective children in Bengal are treated at two private institutions.

No facilities for the training of such children exist in the United Provinces, Punjab, Bihar, Central Provinces and Berar, Assam, Sind, N.-W. F. Province, Orissa, Baluchistan and Coorg.

Causes of Insanity.

Among the predisposing causes of insanity judged from the conditions of admissions during 1936, were mental and moral stress, business and domestic

worries, addiction to drugs and drinks infections, previous attacks and hereditary predisposition. The largest number of cases were between the ages of 20 and 40. Out of a total of 11,798 cases of insanity in 1936, 839 were due to mental deficiency, 1,187 to maniacal depressive insanity, 1,949 to mania, 1,441 to melancholia and 2,195 to schizophrenia including dementia præcox.

Mental Specialists' Conference

First Session in Lahore

NEW DELHI, Dec. 8.

The First All-India Conference of Mental Specialists is to be held in Lahore on January 23 and 24. The Conference will be composed of the members of the newly-formed Indian Division of the Royal Medico-Psychological Association.

This Division is at present the only overseas branch of the Association, the 1,000 members of which are spread all over the British Commonwealth.

The Governments of India and Ceylon, as well as the Provincial Governments, have given special facilities for the mental experts in their services to attend the meetings of the Indian Division of the Association and the Central Headquarters are sending out an eminent member to attend the meeting in Lahore, at which questions of great importance in connection with mental disorders and hospital administration in India will, it is understood, be considered.

WOMEN DOCTORS' HANDICAPS.

Lord Horder's Remarks.

Some most interesting remarks concerning women doctors were made by Lord Horder the other day when he delivered the opening address to the students of the London (Royal Free Hospital) School of Medicine for Women.

"I have met quite a lot of women doctors," said Lord Horder, "and by this time I am fairly at home with them. Is there so much difference between doctoring and nursing, at which women's success calls for no surprise, and still less congratulation? I believe the good man doctor has a little more of the feminine in him than has the average man."

Lord Horder said he believed it to be a fact that the proportion of charlatons among women was much smaller than among men. "You are also said to have more intuition than we have, and there are those who think that this should give you an advantage over us in the direction of what is sometimes called 'clinical instinct' You are more thorough, which is, I suppose, a part of your greater conscientiousness, and, heavens, how thorough you can be!"

"You are as a sex, more curious than we are, and this curiosity has already borne fruit in the hands of those women who have made their names famous in research. That you are more industrious and more studious. I am, with shame, compelled to admit, but I would warn you against vaunting yourselves overmuch about this virtue, for if indulged in to excess this may, like any other virtue, prove to be your undoing."

Lord Horder said he was not satisfied that they were pulling weight as doctors in the field of social economics. When they realised how much of the modern doctor's work was taken up or should be taken up, with preventive medicine, the overlap of medicine with the social status and the happiness of the people became greater every year.

Men's Prejudice.

Lord Horder's remarks have served to remind a writer in the "News-Chronicle" that women are very much handicapped if they wish to follow medicine as a profession, for there are only three hospitals in London at which women can obtain their training. One is the Royal Free Hospital, which takes 355 students, and the other two are King's College Hospital and University College Hospital, which take about a dozen women students each.

The medical schools attached to the great voluntary hospitals like Guy's, St. Bartholomew's and St. Thomas's were opened to women during the war but were closed immediately after.

"The truth, although they won't admit it," said an official of the London School of Medicine for Women, "is that the men don't want women in the medical profession. It is this prejudice which is making it so difficult for women to obtain their training. The excuse is also given that men object to the presence of women students in the medical schools. Women who have obtained degrees and are practising are doing splendid work in all parts of the country and the demand for women doctors becomes greater every year."

"The old prejudice of the public against women doctors has almost died out and many women patients prefer a woman doctor."

Among places which offer facilities to women are Bristol, Leeds and Edinburgh, but at Oxford and Cambridge while women can obtain their pre clinical training, they have to go elsewhere for their clinical experience.

According to the latest figures available at the British Medical Association there are 5,184 women doctors on the register for Eng'and and Wales, Scotland and Northern Ireland as against 38,376 men. In England and Wales there are 2,409 men and 128 women consultants and specialists: 215 men and 11 women consultant teachers: 14,843 men and 990 women panel doctors, and 5,940 and 1,545 women non-insurance General Practitioners.

CAUSES OF EPIDEMIC DROPSY.

NEW DELHI, Dec. 14.

The problem of epidemic dropsy, it is explained, arises in parts of Bihar, Orissa, Bengal and Assam, and although research is not complete, the theory that some deleterious substance conveyed through mustard oil, which forms the cooking oil for the Bengali population of these areas, has received some further confirmation from field investigations, laboratory studies and animal and human experiments. Even after mustard oil seemed to be incriminated, it is stated, the offending factor in the oil has been difficult to detect. It has recently been shown that accidental contamination of mustard oil-seeds with a weed might be the cause, and this line of enquiry is being vigorously pursued in order to determine, if possible, the truth of this theory.

Incidence of Bowel Diseases.

The extent to which the presence of aquatic vegetation in water supplies and the preponderance of any particular species at specific seasons of the

year may exert an influence on the incidence of bowel diseases is being studied in four widely separated towns in the Madras Presidency. It is pointed out that a high proportion of water supplies in certain districts of Madras Presidency appears to contain an excess of fluorides, a concentration of which in drinking water produces mottling of teeth in children and affections of bones of the spine, chest and extremities in adults, and surveys of villages have demonstrated that large numbers of children and adults are affected. A detailed house to house survey of one village and its hamlets has shown that about 74 per cent of the children presented mottling of teeth, while 74.4 per cent of the adults had bone affections. Laboratory experiments are in progress for the removal of fluorides from water and data are being collected relating to the factors, other than fluorides in drinking water, which might contribute to an aggravation of the symptom. Enquiries into the prevalence of this disease in the Punjab are also about to be started. —*The Hindu*.



Report of the Working of the Medical College Co-operative Club, Ltd.

For the Period July—November 1938.

The Co-operative Club was registered during the second week of June 1938, and started work on the 1st of July. It does business in three directions:—Stationery and Instruments, Books, and a Canteen providing lunch to its members.

1. Books to the value of Rs. 5,700 were bought and sold to members. The books were sold at prices considerably below the local market rates only adding to their cost prices a bare minimum to cover the low overhead charges. Deposits for the books along with the orders were received from the members, and the books were supplied at the latest a week after the date of deposit, but usually a day or two after the date of deposit.

2. Notebooks, Colour pencils, and Instruments to the value of Rs. 1,400 were bought and sold. Eight dozen Instrument Sets for Biology, and nine Stethoscopes were supplied to members.

3. In the Canteen there was an out-turn to the value of Rs. 6,000. Coffee is being supplied at the rate of one anna per cup and of excellent quality as can be testified to by our members. Other articles of lunch also are sold at cheap rates, keeping up, of course, a high level of quality of preparations.

The Club made a net profit of Rs. 450 for the five months.

Criticisms.—1. Text-books are not stocked to enable members to get them on payment; this from the purchasers of books. From the management: Will members be prepared to buy their text-books only through the Club, though the price might be that of the local bookseller? If there is, according to the purchaser, a greater margin of profit to the Club, this profit is to be divided among the members only!

2. From the management: In the instruments' section only nine Ste-

Report of the Medical College Co-operative Club, Ltd.

139

thoscopes were sold to the members. In the beginning of this Academic year, did only nine students finish their preclinical subjects and begin pacing the hospital wards?

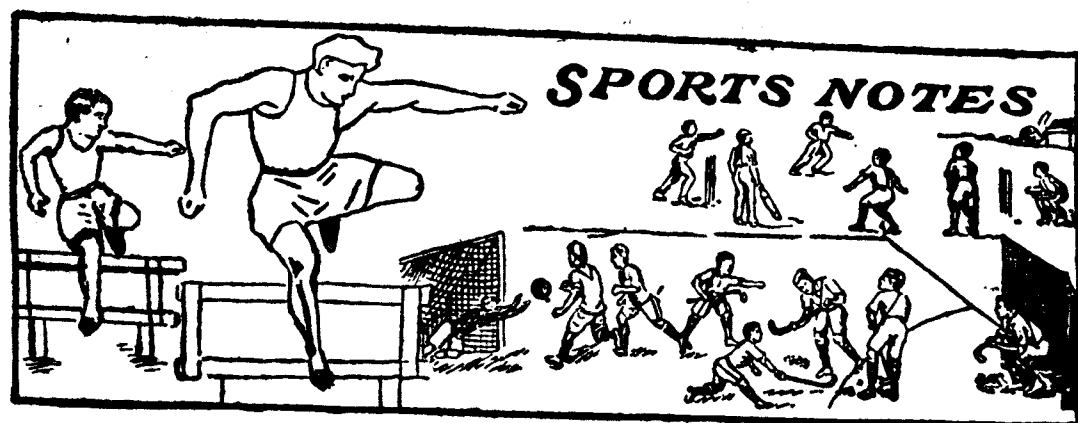
3. From the members: The lunch supplied at the canteen suffers from monotony, there is no variety of dishes. The management pleads guilty to the charge; but the general body of members are certainly aware of the fact that wholesome nutritious food is nearly monotonous. During these five months one Student-Director has been directing the work of the canteen. The general body of members is requested to depute a variety (three at least) of members to share this task with him. Likely they may introduce liveliness into the dishes (Chillies!).

4. From the management.—The share capital up to now subscribed has not reached a thousand rupees! The strength of the College is over seven hundred students. Excluding the final year students, the membership of the Club should include at least five hundred students and the share capital should be Rs. 2,500 at the rate of five rupees per student. Students of this College are reminded of the precepts they have learned: "Each for all," "Union is strength," "United, we stand." They are requested to put into practice what they have learned, as they are going to practise what they are now learning. Quite a decent part of the share capital has been generously subscribed by the members of our College Staff, to whom the Club tenders its heartfelt thanks. But the Club is the Students'

own, and they have to shoulder the financial responsibility also.

5. Even as late as November a few students of the College did not know of the existence of this Co-operative Club! Members are, therefore, requested to persuade their friends, their partners, in the dissecting room, their partners in the lockers and desks of the Laboratories, and their companions in the wards, to join the Club and augment its resources. With the aid of a reserve of money we can stock the necessary text-books, and instruments to be supplied on the spot. Six more members are wanted to assist in the running of different branches of the Club. These members should, preferably, be from the first M. B. classes so that their experience will be available to the Club for a few years. They will assist the student-directors in overseeing the purchase and issue of stores in the canteen, in the checking up of preparations and collections in the canteen, and in the selection of instruments and books in the stationery and books' department.

Business to the value of Rs. 13,000 has been transacted during these five months, and this has been done with the co-operation of only a part of the strength of the College. The others are requested to join in this good work by supplying the necessary share capital and by sending in more students to share in the working of the Club. These members will help themselves in gaining more profits, and more than that, in this community of our College we will have successfully learned and mastered the art of corporate life: the life of mutual help and trust. (*The Management.*)



(SENEX)

Cricket.

The elusive championship in Cricket has come back again to the Medicos after a lapse of two years. All augured well, as the affable, understanding and earnest B. Mahadevan became captain. There was more of team work and grit this year than the past two years. Considering the fact that the general level of Inter-Collegiate Cricket is appreciably higher than ever previously, we can certainly be proud of our victory.

Pots of Adrenaline were wasted on many an occasion. Missing of catches were the rule, than the exception. Some rank bad fielding too, on occasion spoiled the good show. The feeling that a player is indispensable to the team should never be allowed to grow. I would rather prefer to lose matches, than allow rank carelessness in the field. Of course, like so many other fell diseases, this disease too, adds to India's Maladies.

1. The season opened with the match against the Engineers, sensa-

tional cricket was witnessed. The first wicket fell at 3, the second at 8, the third at 8, the fourth at 20. Hogg. A. V. and Muthu back under the trees. Haridas was stuck to the wicket—it is inevitable—and with Rangarajan striking form we put up a total of 111 for which the Engineers replied with 83.

(Haridas 44, Rangaraj 21, Padmanabhan 4 for 12, A. V. 3 for 16).

2. Vs. Law College—

Medical College. 216 for 5 declared.

(Haridas 101, A. V. 81).

(Padmanabhan 5 for 17, Herbert 2 for 14).

3. Vs. Y.M.C.A.—

Medical College 193.

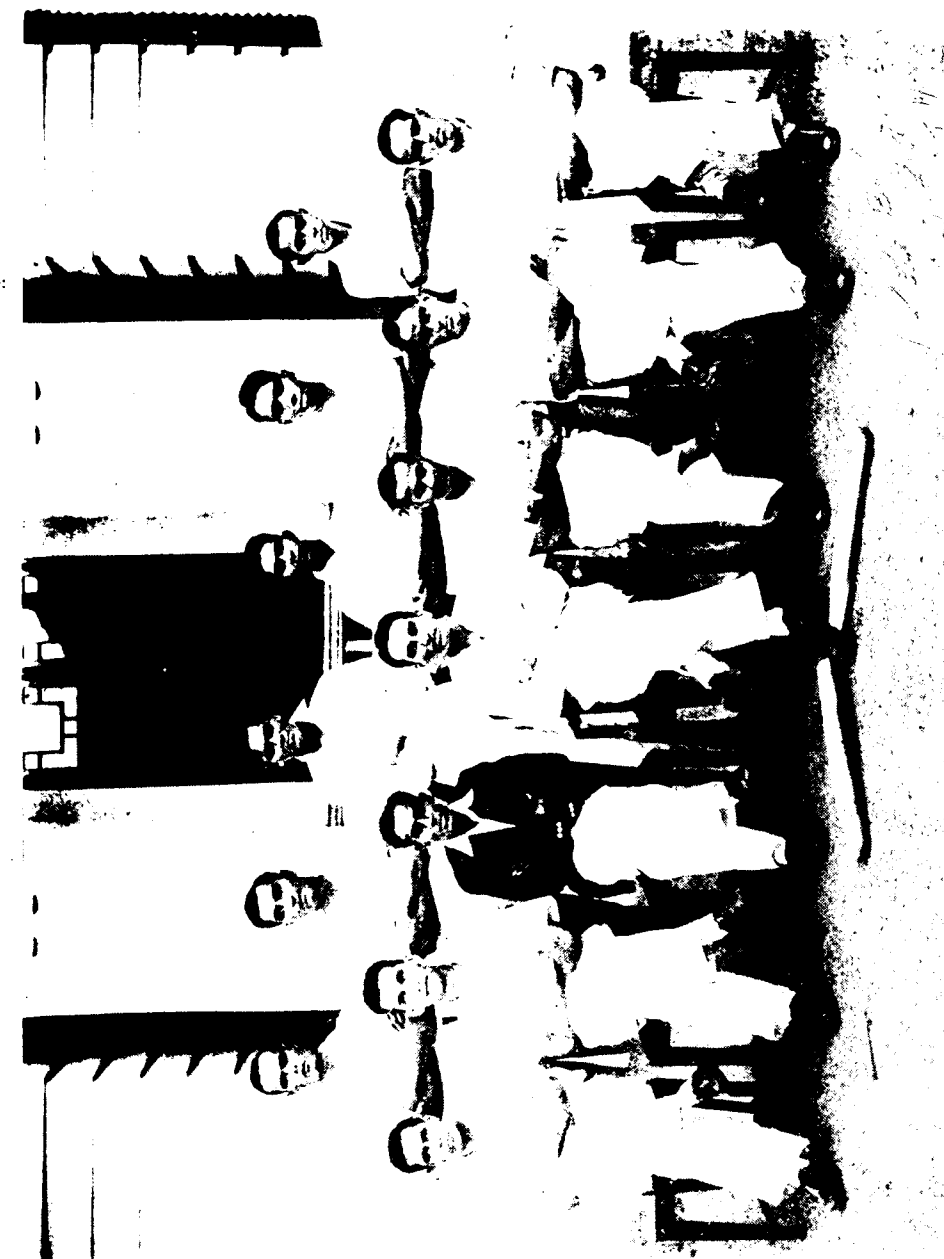
(Haridoss 57, Hogg 51, B. Mahadevan 22, Muthu 20.)

Y.M.C.A. 121 for 5.

(Padmanabhan 3 for 37, Atma Ram 2 for 13.)

4. Vs. S.I.A.A.—

Medical College 194 for 6 declared.



THE COLLEGE XI, Winners of the Inter-Collegiate Cricket Championship.

(Atma Ram 51, Hogg 54, Muthu 33, Haridoss 28.)
S. I. A. A.—99.

(Padmanabhan 6 for 25, Muthu 3 for 22.)

5. *Vs. Presidency.*—This was a much looked forward match. It was considered a test match by both the teams and the result interestedly awaited by all the colleges. The match began in glorious weather on the Marina Grounds and a crowd of nearly 250 watched the Match. The atmosphere was tense and the presence of Messrs. J. Subb-swamy and A. V. Krishnaswamy as umpires lent a special dignity to the match. Presidency College won the toss and elected to bat. The pitch was unresponsive and the bowlers derived little assistance from the pitch. Runs steadily mounted and it looked as if the opening partnership would make a record. Catches were not accepted to the discomfiture of all. The first wicket fell at 97 and then a regular procession started to the pavilion, wickets falling at 104, 127, 130, 132, 138 and 140.

One hundred and forty runs, against good bowling, had to be made. Rama Rao and Hari opened the innings, in pindrop silence. The very first ball was sent crashing to the boundary with terrific cover drive by Hari. That augured well. Rama Rao, in his new role, batted unassumingly but with masterly confidence. Haridoss played the best innings, full of forceful shots, that I have ever seen him do. Runs flowed from him and with Rama Rao delicately tapping the ball towards the leg as well as through the slips, we (we numbered nearly 75) felt happy. The first wicket fell at 58. Hogg entered pensively and played very restrained cricket and the score

mounted very slowly and steadily but at 93 he was nicely bowled by Varadan, while playing forward.

A. V. Rajagopal entered next but soon lost Hari at 117. Atma Ram and A. V. carried the score past the needful and the innings were declared at 151 for 3 but not before A. V. made a terrific six on to the tiles of the pavilion off Ram Mohan, a lovely hit.

With loud and merry singing of "Old Medicos! Never die!" the match ended with the laurels to the Medicos.

Presidency College 140.

(Padmanabhan 3 for 33, Herbert 2 for 29, A. V. 2 for 15.)

Medical College 151 for 3.

(Rama Rao 21, Hari 60, A. V. 33*.)

6. *Vs. Saraswat Recreation Club.*

Medical College 136 for 9 declared.

(Muthu 35, Hari 29, Hogg 31, Mathias 27*.)

Saraswat Recreation Club 114.

(Rama Rao 4 for 41, Herbert 3 for 30.)

7. *Vs. A. I. Sports Club.*

A. I. S. C. 102.

(Padmanabhan 6 for 40, Atma Ram 4 for 29).

Medical College 92.

(Haridoss 28).

8. *Vs. Pachaiyappa's College.* Much was expected in this match but it ended very tamely.

Pachaiyappa's 52.

(Atma Rao 4 for 13, Padmanadhan 2 for 12, A. V. 2 for 6.)

Medical College 63 for 1 declared.

(Hari 35*, Hogg 23*.)

9. *Vs. Mylapore Recreation Club.*
M. R. C. 80.
 (Padmanabhan 3 for 24, Herbert 6 for 33).
M. M. C. 68.
 (Hogg 32).
 10. *Vs. Teachers' College.*
 Teachers College 101.
 (Atma Ram 3 for 16, Muthu 4 for 20.)
 Medical College, 111 for 7.
 (A. V. 23, Mathias 21.)

We were without the services of Padmanabhan, our "Star Bowler." Our innings was opened vigorously by Atma and Hari, the former scoring 10 runs in the first over and getting out to a fine catch. The game took a very bad turn when Hari was run out and Hogg too returned to the pavilion. 34 for 3 and A. V. went in with a heavy responsibility. He looked like staying but was out to a rank and unpardonable swipe, a shot which ill becomes him and that too when the side was in such a predicament. Rangarajan after his fielding lapses looked like one very much short of practice and it was no surprise to see him back in the pavilion with an ill played 5. All of us were on toes and pulse any where between 100 and 150. Muthu too was out to a weak shot. I saw things dancing before me. The glory and success of the match rests entirely on Mathias and Marshall who averted defeat by correct and courageous tactics. That match I can never forget.

11. *Vs. Christian College.*—The Christians ran up a total of 155 mainly the result of bad fielding. Catches were never accepted. It is really a pity that the art of fielding is so sadly given up, and has become a thing of the past.

It was an anxious match. 25 for 1, 27 for 2 and Hogg absent was something serious. A. V. rose to the occasion and played a cautious, aggressive game, with the 'boy' Muthu 'Stump high' protecting his wicket. All depended on the pair. A. V. was out at 87! after a useful 37 consisting of a graceful six and six fours. Atma came back with a duck, and Muthu became grim and tenacious and with his captain began the uphill task. He played a very cautious game and shielded his captain from the 'slow stuff.'

He staged a come back with a 47. Mahadevan deserves congratulation for his fine innings of 21 compiled at the much needed hour. It was a real captain's innings. Mathias in and out and, so so, Marshall 154 for 8. Absolute silence. All hearts audible. Will the two runs be made? In walked Ramadoss, the giant, and sent the first ball across the skies. The match was won. Real cricket indeed with all its anxious moments and uncertainties. But to me, two more such matches means 'Hypertension'.

To single out praise in this match is difficult. The team played to a man with Muthu as its back-bone and A. V., its inspirer.

Christian 155.

(Herbert 3 for 23, A. V. 4 for 43).

M.M.C. 168 for 9.

(Muthu 47, A. V. 35, B. Mahadevan 21.)

12. *Vs. Loyola College.* The last match and no risks and hence full team was mustered. As is usual with cricket, the game opened sensationally with Muthu out for a duck and Hogg out at 9.9 for 2. A. V. Rajagopalan and Haridoss had all the responsibility to them. With Hari his usual compla-



L. M. HOGG,
Captained Madras Varsity, 1937,
Combined Colleges, 1938,
All Madras II Eleven, 1938.



A. K. HARIDOSS,
Captained Madras Varsity, 1938,
Scored 144 against Mysore.



BHASKER MAHADEVAN,
Skipper.



ATMA RAO,
Selected for Madras Juniors XI



A. V. RAJAGOPALAN,
Played for All Madras II Eleven
against Mysore.



V. PADMANABHAN,
Played for Combined Colleges and selected for
Madras Juniors XI



THE COLLEGE XI,
Winners of Inter-Collegiate Cricket Championship.

Sports Notes

cents self and A. V. in match-winning mood, the score mounted up steadily till at 97, Haridoss was run out. A. V. too was out at 124, after, of course, hitting one six, his tally being, a very well compiled and useful 70. He proved his worth and usefulness to the team by his brilliant performance. Rangarajan and Mathias batting with vigour and freedom took the score to 186 for 7, when a declaration was made.

Loyola were all out for 6.

M. M. C. 186 for 7.

(Hari 40, A. V. 70, Rangarajan 25,* Mathias 23.*)

Loyola 66.

(Padmanabhan 2 for 9, Herbert 2 for 3, Muthu 2 for 13.)

Thus after a very interesting series of matches we won the championship and we have to play against the other zone champions for the 'Varsity Championship.

That there is a speck of black in the purest white, a tinge of misery in the height of joy, is amply illustrated by this year's selection to the 'Varsity eleven. Four from our college Hogg, Hari, A. V. Padmanabhan were sup-

posed certainties. But inscrutable are the ways of 'Varsity selectors, Hogg going home for Xmas, left only three from our College but only Hari was selected, the other two being omitted to the surprise and regret of all cricketers. We have to thank the selectors for the small mercies doled out to us and we are a bit satisfied to note that the mantle of captaincy has been placed on Haridoss's shoulders. Probably an inevitable one, after a curious selection.

It is worth while mentioning that Hogg captained the combined Colleges and Hari and Padmanabhan were selected to play for the same. A. V. played against the team and rattled up a Jessopian 56 in quick time bringing his team within an ace of victory. Hogg captained, All Madras Second XI against Mysore and A. V. was selected to play for All Madras. Padmanabhan and Atma Ram were invited to play for M.C.A.'s junior team that toured South India but they were unable to accept the same owing to the examinations. Thus the merit of our players is indisputable and recognised by *all except the 'Varsity selectors*. The days of miracles are not yet over.

Batting Averages.

Name.	Innings.	Most in an inning.	No. of times No.	Total.	Average.
	12	101*	2	448	44.8
	8	70	1	215	30.7
Hari	8	54	1	230	25.6
A. V.	10	47	...	173	17.3
Hogg	10	27*	4	62	15.5
Muthu	8	23*	2	62	15.5
Mathias	6	25*	1	89	12.6
Marshall	8	51	1	95	11.9
Rangarajan	9	21	...	72	9.0
Atma Rao	8	22	1	75	8.3
Rama Rao	...	...	...	...	...
B. M. D.	10	...	...	...	...

Bowling Averages.

Name.	O.	M.	R.	W.	Average.
Pattu	111.8	32	209	34	6.15
Aton	82.0	17	167	17	9.82
Muthu	21.0	1	95	9	10.56
Herb	94.0	28	202	19	10.63
A. V.	71.8	20	185	15	12.33
Rama Rao	32.0	8	98	6	16.33
Rangaraj	21.2	1	70	4	17.5

Hockey.

The College eleven has done very well this season. They are second only to Telegraphs, the Madras Champions. It was sheer bad luck that lost us the trophy at the Mount. In the Inter-Collegiate League, we drew with Technology, due solely to rotten umpiring and lost to Christian, because the team was depleted to reinforce the football eleven. All the other matches we won without much exertion and we are well on the way to the Varsity Championship.

Football.

The general level of Inter-Collegiate Football is deplorably low. Constructive and good football was very rarely seen. This is well reflected from the

league tables. No College has done anything outstanding, everyone losing, drawing or winning, without rhyme or reason. We are second in the league but we only, are qualified, to contest the other Zone champions for the Varsity Championship.

Tennis.

Mohanrangam created a sensation by defeating Bobjee Madras's No. 2— in straight sets, in the semi finals. In the finals he had all his own way and earned a well merited victory over Moses. But one is very sorry at the way he played the doubles. A. V. had to play against three in the doubles and it is not surprising we lost the doubles. Such actions are extremely objectionable and unbecoming of sportsmen.



THE COLLEGE XI, Winners of the Inter-Collegiate Hockey Championship.
By courtesy of "The Hindu".

In Lighter Vein.

(From the J. A. M. A.)

A Medical Student's Lament.

Of course it's only human to be seeking
after fame
But why must every scientist attach
his funny name
To diseases and to organs, to bacteria
and stains!
It's about this horrible practice that
the medico complains.

He learns about the cells of Reed and
Dalyrimple's sign
The Vein of Galen, Traube's space,
pyramids of Verein,
Peyer's patches, Rehfuss tubes, the
Nodes of Ranvier,
Aschoff bodies, Stenson's duct and
glands of Jean* Liltre.

There's Goetch's test, and Stenberg
cells, and Froehlich's syndromet
There's Bowman space and Douglas
pouch, triangle of Petit,
Kroenig's isthmus, Gull's disease,
Erd's sign, McBurney's point,
Canal of Hunter, Morey's laws, Gall's
tract, and Charcot's joint.

We are plagued by names like Zucker-
kandl, Langerhans, and Schlemm,
Because they found some structure
and they named it after them.
You may laugh but how they haunt
me—even in my sleep I hear
Names like Wrisberg, Santorini, Cohn-
heim, Reusch and Vicq d'Azir.

* For all I know that may be his correct given
name.

† Correct pronunciation: Authority: Webster.

The Charge of the White Brigade.

Fear not the young nurse who stands
by the side
Of your man, when he's sick and in
pain,
For after a siege with his grunts and
his groans
She'll give him up gladly again.

She may woo him to sleep with her
voice as she lays
Her cool hands on his poor fevered
brow,
But remember, you wives, that this
menace in white
Sees him not with the eyes of his
frau.

To her, he's a bulk to be freed of its
pain
Just a means of her own daily bread.
He gets egg on his sheet, and toast in
his hair
And his feet dangle out of his bed.

He snores all night long with his
mouth open wide
While his teeth float around in a
glass,
No sex appeal lurks in that bewhis-
kered chin
And his chorus is minus all class!

So lay yourselves down, all you green-
eyed young wives

On your bed, and well know while
you rest

That this treasure of yours is as safe
with his nurse

As a bird on a bough in its nest.

R.R.G.

He may answer the maidenly prayer
of the one

Who got him for better or worse,
But whatever his assets or charms to
his wife,

He's a pain in the neck to his nurse!

C. M. C.

A Grateful Patient Testifies.

(Poem received by A. E. G. Illinois)

When a bone is set for knittin',
There are seven weeks of sittin'
And it calls for lots of nerve to see it
through;

When the leg's all cast in plaster
The day goes so much faster
When a friend drops in to share joke
or two.

When the day seems long and ratty
And you think you'll sure go nutty
And a guy walks up and helps you
smile it through,

You enjoy it like the devil
If the guy is on the level
And the hand he slips you's on the
level too.

So you guys can be a bettin'
That I'll not be soon forgettin'

How decent and how swell you've
been to me,

As when I am relatin' and I
suppose—

A datin', from the days you helped
me nurse

My busted knee.

Jack Stewart.

A Legitimate Protest.

(Written by T. D., Arkansas, on
receiving a combination pen
and lighter.)

When I go to buy a lighter,
I don't want a lighter-writer.
I'd rather have a lighter that will
light.

But when I write a writer
I don't need to light a lighter.
I rather hope the writer
Will light a little lighter
And help a poor dumb blighter
See the light.

But the lighter won't light.
And the writer won't write
Any sense.

And the blighter, he blights
On the fence.

OUR EXCHANGES.

We acknowledge with thanks the receipt of the following
Exchange Journals:—

St. Aloysius College, Mangalore.

Government College, Mangalore.

Osmania Medical College Magazine, Hyderabad.

Vizagapatam Medical College Magazine, Vizagapatam.

Grand Medical College Magazine, Grand Medical College, Bombay.

The Journal of the Indian Medical Association, Calcutta.

The Sind Medical Union, Karachi.

Indian Journal of Venereal, Bombay 4.

Medical Digest, Bombay 4.

Malayan Medical Journal, Singapore.

The Burma Medical Times, Rangoon.

The Indian Medical Journal, Madras.

Medico Surgical Suggestions, Madras.

Journal of the Andhra Medical Association.

The "Antiseptic," George Town, Madras.

King George's Medical College Clinical Society, Lucknow.

Journal of the Indian World.

The National Medical College Magazine, Bombay.

Patna Medical Journal, Patna.

St. Joseph's College Magazine, Trichinopoly.

Journal of South Indian Medicine, Madras.

Madras Medical Journal, Madras.

The Stanley Medical College Magazine, Madras.

NOTIFICATION

ENDOWMENT LECTURES, 1938-39

The Registrar, University of Madras, announces that Sri. N. S. Narasimha Ayyar, L.R.C.P. (Lond.), F.R.C.S. (Eng. and Ire.), Assistant to the Professor of Surgery, and Lecturer in Orthopædics, Madras Medical College, will deliver the Dr. Elizabeth Mathai Lectures as detailed below in the North-East Lecture Hall of the Madras Medical College, commencing at 5 p.m. each day. The lectures will be open to members of the profession and senior students of the College.

Date.	Subject.
Tuesday, 10th January, 1939	Congenital Deformities of Children in Madras.
Tuesday, 17th January 1939	Acquired Deformities of Children in Madras.
Tuesday, 24th January, 1939	Backache in Women in Madras.

TOLET

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Havero Trading Co., Ltd., the sole representatives of "Bayer" Laboratories at Elberfeld, Germany, beg to announce to the profession that Disseptal some time ago referred to in British Medical papers is now introduced in India under the trade name 'ULERON'. It is the first successful chemotherapeutic against gonococcal infections. Up-to-date clinical results show that its curative action is best seen in sub-acute and chronic gonorrhoea and its complications, *i.e.*, when the patient has developed a certain amount of specific resistance. A course of treatment lasts for 3—4 days only and has been found sufficient in a large percentage of cases. Only in resistant cases is a second course of treatment necessary after an interval of at least 6 to 8 days. Relapses are comparatively very few. Such a short course of treatment with a very high percentage of successful results in a disease which has so far baffled all kinds of treatment is a unique achievement indeed.

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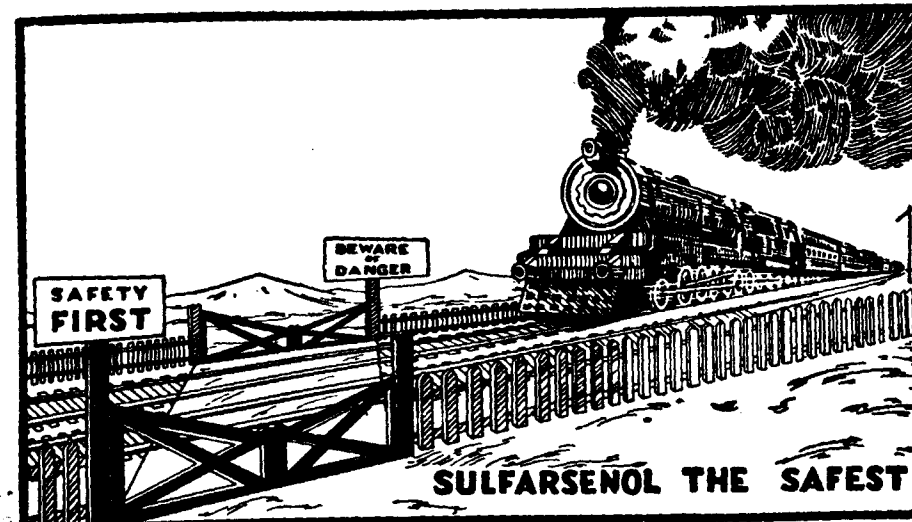
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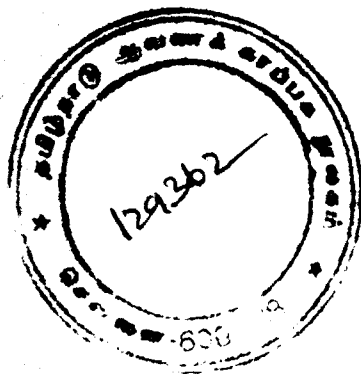


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