The Madras Medical College Magazine

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GENERAL EDITOR

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Surgery of the Prostate—A Resume.

By Dr. Mangesh Rao, M.B. & C.M., F.R.C.S.E.

(Continued from November issue.)

Tubercle of Prostate.

Primary involvement of prostate is rare, forming about 2 per cent. of genito-urinary tubercle. It is more common in conjunction with tubercle of seminal vesicles and epididymis. It may also be involved by descending infection from renal tuberculosis. In most cases tubercle starts in the vicinity of ejaculatory ducts spreading to the lateral lobes, but the middle lobe is less often involved. Prostatic lesions are more pronounced on the side on which the vesicle or epididymis is involved.

Pathology.—Tubercles are more often found in the stroma suggesting lymphatic spread. The infection may spread to periprostatic tissues and abscesses open in the perineum ending in urinary fistulae. Denonvillier's fascia is more resistant to invasion and hence rectum is not often involved. Upward spread involves the vesicles, epididymis, and bladder. Urethra is not involved as often as one would expect. But if involved ulceration occurs. Kidneys may be infected by ascending infection by peri-urethral or retro-peritoneal lymphatics or intramural ascending infection of ureters.

Symptoms.—Often there are no symptoms present in the early stages. Pain in the prostate and sexual disturbances may be the first symptoms. Later urinary disturbances as irritation, burning, frequency, dysuria and hæmaturia may be present. Blood stained seminal discharge may occur in some. As the disease advances involving the trigonal area urinary symptoms become worse. With involvement of epididymis other symptoms appear. Prostatic examination should be done as a routine in all clinical cases. In suspicious cases massage of prostate is done for culture and guinea-pig inoculation, the glans and urethra being rendered aseptic, especially contamination with smegma bacillus is avoided. Cysto-urethrascopies are also done.

Diagnosis.—Presence of induration with negative history for gonorrhœa are difficult to differentiate from chronic prostatitis. Guinea-pig inoculation has to be done to distinguish tubercular condition. If no secretion is available urine voided after massage as advised previously should be used for cultural inoculation. Cystoscopy may be required to eliminate renal tuberculosis. Primary tubercle of prostate with enlargement in the old is difficult to distinguish from cancer of prostate and only made out after radical excision.

Treatment.—Primary tubercle in early stages is rarely seen, usually being fairly advanced. In 50 per cent. epididymis is involved and in 20 per cent. kidney. For involvement of seminal tract radical removal of prostate, vesicles by perineal route of Young and removal of epididymis by inguinal route is the best. If one kidney is involved and other healthy a nephrectomy may also be done with good results. Simple removal of epididymis or orchidectomy is no advantage. Sanatorium treatment should also be carried out. Bladder is treated with gomenol injections.

Benign Prostatic Hypertrophy.

This is really formation of pure adenomas or mixed with fibro-muscular tissue in an otherwise normal gland. In 90 per cent. it is really an adenoma in the prostate. In the earliest stage a small slightly capsuled group of gland tissue called "spheroid" is seen, from hyperplasia of one or more acini. Other spheroids also form and as they grow coalesce and acquire a capsule by compression of surrounding interstitial and glandular tissue. The earliest spheriods arise from the sub-urethral glands, most commonly in the lateral walls of urethra beneath the floor and next in the so-called mid-lobe area above the ejaculatory ducts. These grow at variable rate. Some may grow rapidly and enlargement of prostate occur in a few months. Others may take months or years to cause enlargement. In most cases more than one spheroid appear with individual capsules, but with growth they coalesce and acquire a pseudo-capsule for the whole mass. When they grow in the lateral lobes urethra becomes pressed into a vertical slit or a crescentic one or other shape. Adenomas above the level of ejeculatory ducts and in the urethral floor raise the urethral mucosa and flatten it antero-posteriorly into a crescent. With further growth it pushes the sphincter, trigone and bladder upwards increasing the length of urethra. Then it begins to protrude into the bladder as a vesical projection at the neck near the floor. Mid-lobe hypertrophy may occur alone or more usually in conjunction with adenomas in lateral lobes. With growth they coalesce into one mass often difficult to differentiate into lobes.

Adenomas may arise from the Sub-cervical glands resting on the sphincter or from the sub-trigonal glands at the anterior part of trigone. Sometimes these glands may extend to the back part of trigone. Adenomas may occasionally arise from the anterior commissure. It

appears as a small rounded mass in the submucosa of the roof, generally external to the sphincter and with growth may project into the bladder.

The rest of prostate is pushed aside first and ultimately may become compressed into a fibrous capsule. This adventitious fibrous capsule is usually in several layers. In enucleation if the line of cleavage nearest the adenoma is followed each lateral lobe will come out separately but if a more external line of cleavage is followed the anterior commissure will come away with the lobes in one mass.

Transcapsular lobes are adenomas found projecting through the prostatic capsule and felt per rectum as small pea-like swellings, sometimes larger. This is due to giving way of the capsule from pressure. These develop in the posterior or posterior part of lateral lobes. Denonvilliers fascia resists much longer but may give way and adenoma grow towards the ischio-rectal fossa.

Retro-vesical lobe.—The principle growth here can take place upwards and laterally and the adenoma projects considerably towards the bladder pushing its neck upwards and forwards the sphincter being left intact. The growth surrounds the sphincter lying between the trigone in front and vesicles and vasi behind. By intra-urethral method of removal the lateral lobes and median lobe come away with little damage to the sphincter. By the Freyer method the lateral lobes, median lobe and posterior lobe come away in one mass as a much thicker capsule is removed. Very little prostatic tissue is left behind to form a capsule for the remains of prostate.

Changes in the urethra depend on the size, number and site of adenomas. Either the length or width of urethra is increased and its lumen is distorted. In bilateral hypertrophy lumen becomes $\wedge$ shaped with verumontanum

between the limbs, if median and lateral lobes are involved urethra becomes $\cap$ shaped. The intra-vesical enlargement appears horse-shoe in shape. With peri-urethral adenomas urethral mucosa shows hyperæmia, œdema, ulceration, hæmorrhages, polyps, etc. The vesical sphincter is made of two lateral bundles of muscles inserted into the sides of median prostatic mass over which the trigonal muscle passes to be attached to the upper end of verumontanum. This arrangement permits the lateral lobes projecting into the bladder. In the majority of cases of upward growth of lateral and median lobes, the growths project between the mucosa and sphincter which gets stretched and dilated. In others the sphincter may be pushed well up into bladder but remain intact. In some a definite posterior bar forms which resists dilatation when hypertrophy has occurred. In sub-cervical and sub-trigonal adenomas the sphincter remains intact and these cases should be dealt with by intra-urethral punch operation.

Pathology.—A section of an adenoma is light coloured and moderately elastic or soft in consistence. One may see rounded spheroids. The epithelial part is light yellow and opaque, the stroma is greyish and slightly translucent, generally more abundant between the spheroids. A milky secretion can be expressed from the surface. Here and there some cystic areas are often seen and occasionally small calculi in them. Microscopically marked hyperplasia as foldings and villi within the acini, is seen. But the normal architecture of the epithelial layer is preserved, the villi do not fuse and the basement membrane is intact. The tubules increase in length and complexity. Normal contents as epithelial debri and corpora amylacea are seen. In the cystic parts the epithelium is thin and of single layer, the acini and cysts open into the ducts and a prostatic massage gives fairly profuse secretion. In the soft types hyperplasia is chiefly epithelial but in the firmer

types it is also fibro-muscular, myomatous. But pure myomata are not common, epithelial hyperplasia is always mixed with them.

Infection may take place ascending from chronic urethritis, descending or from surrounding structures as rectum. Instrumental infection is most common from catheterising. B. Coli, staphylococcus or streptococcus being commonest. Acute congestions follow with increase in obstruction. Later round cell infiltration, followed by fibrosis. This induration may be suggestive of carcinoma on rectal examination from fibrotic nodules being palpated. It may extend externally particularly on the lateral sides and at prostato-vesical junction. The ejaculatory ducts, vasi, vesicles also get involved with fibrosis and adhesions. If inflammatory change occurs in the early stages it ends in a sclerosed prostate. In the region of vesical orifice such a change gives rise to bar formation or contractures and obstruction signs become far more pronounced.

Symptoms.—The time of onset depends on the competency of trigone to open the vesical orifice, and the changes occurring in the lumen of the urethra, and vesical neck. These depend on the site and size of adenomas and the presence of inflammatory changes and fibrosis.

The first sign is hesitation in the beginning of micturition. Interruption of stream, the act being completed in two or three attempts.

The stream is norrower than normal with some pain and discomfort.

A slight increase in frequency, often noticed by night. Patient finds that he has to get up very early in the morning for voiding urine. Then he may have to get up in the middle of night, later more often.

At this stage there is little residual urine but the bladder capacity is reduced by compensatory hypertrophy and the trigone is also hypertrophied This allows the patient to carry on as the trigone is competent to open the sphincter. But the prolonged and frequent spasmodic trigonal contractions produce back-pressure on the ureters. Dilatations of ureters, and renal pelvises occurs ending in renal impairment. This may be marked in such cases without marked obstructive bladder symptoms. A few may have nausea, headache, dizziness and cardio-renal symptoms which may completely overshadow the prostatic symptoms.

In the majority of cases increasing obstruction with more and more residual urine results in increased frequency or in dilatation of bladder. If dilatation occurs early frequency is not so marked as the difference between the bladder capacity and residual urine is great. But these patients may notice a steady increase in the size of lower abdomen.

Frequency,

$$F = \frac{\text{TU-total urinary excretion in 24 hrs.}}{\text{WC-working capacity of bladder}} = \frac{1600\text{c.c.}}{400\text{c.c.}} \text{ 4-times (normal)}$$

This figure varies with quantity of fluids imbibed in 24 hours and such conditions as diabetes. The WC in prostatic cases is decreased by vesical hypertrophy or residual urine.

If BC is total vesical capacity and RU is residual urine then WC is the difference between BC and RU. Hence BC increases with RU, F may remain near the normal. Hence patient may carry on till difficulty is greatly increased or retention occurs.

Catheterization in such patients may render him unable to void urine voluntarily and there is also the

danger of onset of anuria from sudden complete emptying of bladder as the kidneys have been working against a certain intravesical pressure which is now suddenly removed. Acute congestion of kidneys, suppression of urine occur.

Hæmorrhage is more often seen in adonomatous prostate than in cancer.

Disagreeable burning or irritation may also be present.

Pain and irritation may be absent in some with great hypertrophy and obstruction, in others irritation and burning may be very severe. Rarely pain may be spasmodic and severe and may radiate.

With onset of infection symptoms become aggravated, chill, fever, increased irritability and frequency set in. Pyelonephritis, urethritis, cystitis, periprostatic and periurethral abscesses may also form. Infection most often is due to instruments but may occur in large residual urine cases de novo (a descending infection from kidney).

Cardio-vascular disease in some form or other is present in 50 per cent. arterio-sclerosis, hypertension, myocarditis may be present. Mental changes in these may occur due to cerebral arterio-sclerosis.

A chronic uræmia of insidious onset and progress is present and liable to be overlooked both by the patient and physician and catheterization for retentions may end in anuria with fatal results.

Hæmaturia and pain are surprisingly common in this condition and fibrosis of enlarged gland may give a feel like carcinoma.

Rectal examination —The size, shape, contour and consistence (4 degrees, normal-elastic; first degree; slight induration; second degree; moderate induration and third degree very hard as in cancer) of prostate and its surrounding structures are noted. Next adhesions, infiltrations, enlargement of seminal vesicles, etc., are noted.

It most cases with no history of gonorrhœa induration is absent or slight. A deep groove between two definite enlargements is felt in enlargements of lateral lobes. The normal notch at the upper end in often replaced by a rounded swelling in mid-lobe enlargement. Elasticity may not always be present but induration slight or more may be found. In some it may be of the third degree and difficult to diagnose from carcinoma. The contour is more often uniform both sides being practically equally enlarged but later one lobe may be more prominent, giving an irregular shape. Occasionally small bean-like swellings may be felt either on the lateral or posterior side. Sometimes it may be soft and evenly enlarged to a great size resembling a sarcoma of prostate.

Bladder and urethra-examination.—First find out if the bladder is distended, by percussion and palpation, after the patient has first voided all the urine he can. If bladder is well above the pubis gradual decompression of bladder is to be done If bladder is not well above the pubis, after voiding the urine a cystoscope is passed, urine drawn off and measured—"Residual urine." Then bladder capacity is noticed and a general examination of bladder walls, trigone and vesical outlet and prostatic opening is done and mapped out. An anti-grade and retro-grade cystoscope are useful for this.

Trigone is found hypertrophied and enlarged and is diagnostic of obstruction at the prostatic orifice.

Bladder.—The character and extent of trabeculation, the presence of pouches, cellules, and diverticulae, stone,

ulcers and cystitis is noted and charted. Residual urine may be slight or more. It increases with increasing obstruction and with frequency and difficulty in urination. In some it may increase so silently that the patient is unaware of a distended bladder.

If residual urine is under 200 c.cs. bladder may be emptied, but if 400 or above a gradual decompression should be done. The presence of a diverticulum may mislead as regards the amount of residual urine but here the cystoscope is useful for diagnosis.

Hæmorrhage most often is from the urethra and the bleeding vessel can often be seen in the posterior urethra and fulgurated by the antigrade telescope.

Renal functional tests.—The phthalein test is the best. A retained catheter is used and the 'appearance time' and amounts eliminated in the first, second, third and fourth half hours after injection and the fifth at the end of two hours from appearance time are found and charted as a graph.

If R U is 400 c.cs. or above, blood urea is estimated and at a later date after decompression, the phthalein test is done.

X-ray examination is done for presence of stone in the kidney, ureter bladder, or prostate. For diverticulum a stereoscopic cystogram will help to show the size and character of diverticulum.

A cystogram may also show the intra-vesical enlargement of the prostate.

Blood chemistry.—Urea-N or non-portein nitrogen should be determined. It must be remembered that this nitrogen returns to the normal long before the kidney function

returns to the normal as shown by the phthalein elimination test. Hence phthalein test is important for finding the renal efficiency.

General examination of heart, lungs, arteries, blood pressure, gastrointestinal tract, teeth, etc., is done to evaluate the condition and ability of a patient to stand a severe operation.

Diagnosis.—In a man past 50 with a history of hesitation and gradually increasing frequency of urination with an enlarged and elastic prostate and with residual urine, trabeculation of bladder, and hypertrophy of trigone and rounded projections seen on the lateral or median part of prostatic outlet of bladder is clear evidence of adenomatous hypertrophy.

Chronic prostatitis may give same symptoms but on rectal examination the finger does not dip into a groove on pressure and on palpating it against cystoscope in the urethra an increase in thickness and induration in the median line without enlargement of lateral lobes is noticed. A median bar can be made out by cysto-urethroscope.

Such a median bar requires punch operation but if with enlargement requires prostatectomy.

Carcinoma usually has a marked (stony) induration of third degree and seminal vesicles may show induration, sometimes localised to a portion of gland only. Where induration is more extensive carcinoma is suggested. Sometimes the prostate may feel elastic and enlarged even in carcinoma and only examination of frozen section during the operation may show which it is. In extensive induration expression of secretion after massage and microscopic examination is helpful. 20 per cent. of cases of prostatic enlargement with obstructive symptoms are

carcinomatous and 50 per cent. of these show both carcinoma and adenoma.

Tuberculosis may exist with adenomatous enlargement and in early stages may be mistaken for carcinoma. But usually the seminal track shows also changes. Till bladder is also involved urinary symptoms of obstruction, etc., are absent.

Calculi embedded in the prostate near vesical outlet give rise to same symptoms and only X-rays will be helpful in diagnosis. Trigonal hypertrophy may be so great as to give rise to bar-symptoms.

Spinal lesions may cause changes in the prostatic urethra, sphincter and bladder with symptoms suggestive of enlarged prostate-residual urine, marked frequency, distended bladder, back-pressure effects as pyelonephritis, and uræmia. Rectal examination in these shows absence of prostatic enlargement, a wide notch and a wide median furrow suggestive of dilated posterior urethra. Cystourethroscopic examination show dilated urethra, dilated sphincter, atrophic trigone, fine trebeculation. Occasionally there may be hypertrophy of prostate. History of syphilis, serum reaction, etc., will settle it.

Treatment—1. *Early stage.*—Where symptoms are not annoying, frequency is slight and sleep is not disturbed, no signs of back-pressure, or uræmia, kidney function is good, the patient may wait. Stripping of vesicles and prostate once a week may help in reducing its size. Instrumentation is to be avoided, patient should void urine every four hours and avoid constipation and exposure to chill. .Warm hip-baths are good.

2. If the general condition is too bad to stand an operation and residual urine is not much, prostatic massage, instillation of posterior urethra with diffusible

dye antiseptic ; but if residual urine is large intermittent catheterization is done.

3. *Catheterization.*—Glans and anterior urethra are to be washed with an antiseptic each time. Rubber catheter with an elbow or one that can take a stylet in (tip not solid) should be used. Failing these a coude or bi-coude catheter is used, Eynard's boilable is the best. All should be done under aseptic and antiseptic precautions.

4. Radium treatment is not successful in all cases. Application is done per rectum and per urethra. Later a punch operation is done for the resulting bar-formation.

Preliminary drainage is always indicated in cases with marked impairment of kidneys, severe infection or large amount of residual urine. In addition hydrotherapy, ingestion of large amounts of water by mouth, rectum, subcutaneous or intravenous if nausea is present. Complete rest and toning up of cardio-vascular and other systemic lesions.

If residual urine is less than 150 c.cs., no vesical complication and kidney function is good, general health and cardio-vascular system is good, prostatectomy can be done in one stage.

Preliminary drainage of bladder is indicated in cases of considerable residual urine and renal impairment, either by intermittent catheterization under aseptic condition or a retained catheter, where frequent catheterization causes pain, bleeding, etc. A Nelaton's or a coude catheter is used. It should have two eyes, and not project too far into bladder to cause irritation or kinking of catheter. The bladder is washed several times a day with a bland antiseptic and catheter changed every three days. The urethra should be washed with a warm lotion and given four hours rest before another is placed.

Where residual urine is over 400 c.c. (12 ozs.) and blood urea is over 60 mgs. per cent., decompression with Young-Shaw apparatus attached to a retained catheter or suprapubic drain should be done. First the pressure is read off *i.e.*, the height at which outflow from bladder just ceases and the height is reduced 2 cm. below this. Every 2—3 hours the height is reduced by 2 cm. till zero is reached in about 72 hours. Later phthalein test is carried out. But blood-urea is done at once and after decompression. It may take weeks or months for patient to be fit for operation. Sudden decompression is followed by fall in B.P. and marked decrease in output of urine.

Complications.—(1) Infection is liable to take place whatever the method. Chill, fever sometimes severe septicæmia, more often a few days of acute infection which settles down into chronic urethritis and cystitis.

(2) Peri-urethral abscess or periproatstic infiltration may occur.

Digital examination is frequently done and drainage when necessary.

(3) Epididymitis—conservative treatment, incision when abscess results. Vasectomy under local may be done as a preventive (Stienach's)

Supra-pubic drainage may be done with a de Pezzer catheter and the decompression apparatus attached to it. Catheter should be changed once a week and bladder irrigated with antiseptics.

General treatment.—Hydrotherapy by imbibing water upto 5 litres per day except in cardiac cases, will improve the kidney and urea retention.

For cardiac cases, digitalis should be given and in bad cases strophanthin may be prescribed. When heart is improved water should be freely given.

High blood pressure will come down after decompression and rest with digitalis, hydrotherapy and regulated life and diet.

When the general condition is improved operation may be performed.

Diabetes is treated by diet and exhibition of insulin.

Teeth and focal sepsis, etc., should also be attended to.

Operative Treatment.—Sacral anæsthesia with 20 c.c. of 3 per cent. novocain taking care that neither blood nor C. Sp. Fluid comes through needle. 10—12 minutes for anæsthesia. Turn patient on his back and put in 15—20° Trendelenburg position, raise perineum on a big sand bag.

Perineal operation.—1. Skin incision ∩ shaped, highest point near bulb. A sound or urethral type of tractor should be passed in first. Cut skin and fat. Finger and blunt dissection in ischiorectal spaces on either side, feel edge of triangular ligament in front and push rectum back behind and sides.

Now feel the central tendon and put bifid tractor and pull. Cut the tendon near bulb, push back the rectum. Expose Recto-urethralis by blunt and finger dissection. Cut the muscle carefully near membranous urethra. More blunt dissection exposing 1·5 cm. of membranous urethra covered by compressor muscle.

Apex of prostate is exposed, cut into it without damaging the compressor. Catch mucosa with Allis forceps, withdraw sound, introduce Young's tractor and pull down prostate. More blunt dissection exposes a fibro muscular layer. This is cut at the sides carefully and wounds enlarged. This exposes the anterior pearly layer of Denonvillier's facia. More blunt dissection is now done to

expose the whole of posterior surface of prostate. Retractor is put in and rectum pulled back.

Two verticle incisions on either side of the central grove are made. By blunt disection the lateral and median lobes are delivered. The lobes are reached at a depth of 3-8 mm., *i.e.*, the thickness of false and true capsule.

Next finger is introduced and any masses left removed, stones, bar, etc., are felt and removed. Sphincter if not dilated is dilated.

Next Davis bag is introduced into bladder through Young's introducer. The mucous membrane of urethra is caught by two pairs of Allis forceps on either side before introducing. It is advisable also to place a catheter through the urethra before bag is placed into the bladder. The bag is now distended with water and traction applied to it through tapes attached to it. Bladder is now washed clean through the central tube of the bag. Now all bleeding points in the wound are ligatured and wound washed with 1 per cent. mercurochrome and the Levator Ani are brought together anteriorly by catgut. The bag drainage tubes are brought out on one side of wound and the rest is closed, leaving a small gap where the drain is coming out. The tapes are pulled on and caught by a clamp which is left on after dressings are fixed on.

A thick pad should be used. Clamp can be removed after 6 hours if the fluid from bladder is clear, but if blood begins to flow again it is reapplied with tension on the tapes. When released the bag floats into the bladder Next day the water from bag is released. After 48—72 hours the empty bag can be removed by traction.

If secondary hæmorrhage occurs on the 7—9th day packing into the wound and neck of bladder should be done by the Surgeon himself. Hydrotherapy, digitalis, stimu-

lants, etc., are given as required. Saline by mouth, per rectum, subcutaneous or even intravenous is given as required. For infection hexamine by mouth or intravenous, is tried and bladder irrigated by catheter passed per urethra.

2. After exposing prostate, an inverted V-incision is put and urethra exposed and two verticle cuts are made into it on the tractor. The flap is turned down bringing down verumontanum. Now finger is pressed against the roof of urethra and it is ruptured here and enucleation of whole prostate is done leaving behind the anterior commissure. Bleeding points at the lateral part of vescial neck can be ligatured. If anterior commissure comes away a plastic may be done. The roof of urethra is reformed by pulling down bladder mucosa and suturing it to urethra at the apex of prostate and on lateral sides. The ligature tying the lateral vessels are brought out through the two edges of prostatic capsular incisions on either side. A similar stitch brings the basal mucosa to apex of verumontanum and comes out through capsule and when tied constricts the ejaculatory ducts for some days preventing ascending infection of epididymis. A mattress stitch at lower end of urethra and apex of V-incision and passing through the apex of prostatic capsule are put. A catheter is passed in and the stitches are tied. This practically closes the prostatic cavity with formation of a urethra and ligature of vessels also as in Thomson-Walker method. Sometimes 6 points require ligature and the ends can be similarly brought out of the capsule and used for plastic approximation of vesical mucosa with that of urethral one. Next the Levator Ani is brought together by a stitch. A drainage tube is put in one angle and rest of wound is closed after washing with spirits and mercurochrome lotion. Catheter should be of large size and bladder washed and drained. If bleeding occurs the stitch at the apex

of prostate may be omitted and Davis bag inserted and brought out here.

Prostatic abscess if present should be drained and urethra and bladder washed before further procedure is done.

Seminal vesiculitis if present, vesicles are opened and drained the drain tubes coming out at the angles of wound.

Prostatic calculi usually lie between the adenoma and the false capsule and can be removed by a curette.

Peri-prostatic adhesions should be broken down, lobules or glands also can be removed.

Operative mortality even with good Surgeons is 20 per cent. by supra-pubic route. This can be lowered by careful preliminary treatment to lower the blood urea, etc. Young has reduced his mortality to less than 2 per cent.

Epididymitis occurs in 15 per cent. and adds to mortality. Vas should be ligated just above the epididymis by subcutaneous method soon after admission before instrumentation is done. Retained catheter is often the cause of this. If it occurs early incision is indicated.

Supra-pubic.—Under spinal, 4—5″ incision, muscle split up to 1 cm. from symphisis, retractors inserted, peritoneum and areolar tissue pushed up. Bladder wall caught with Allis forceps, bladder emptied of lotion through the catheter which was left in. Stab incision made, downwards and mostly upwards for 3″. Retracter inserted inside after catching the mucous membrane and wall with Allis forceps. Now tumour is surveyed.

Intra urethral method.—Index finger is pushed into urethra from bladder side and pressed into anterior cleft and laterally. Mucosa gives way and finger slips into the

line of cleavage between the lateral lobe and capsule. Enucleate the lobe. The other side is similarly dealt with. Attachment towards the apex should be detached before lobes are completely freed. If any difficulty arises, get the finger behind the attachment and push it towards the symphisis and the urethra gives way just above the ejaculatory ducts and tumour is free to be pulled up and out.

The other method (Freyer) is to rupture the bladder mucosa adjacent to the projecting tumour and start separating the tumour from above. In this the proper line of cleavage may be missed and anterior commissure may also be included in it and more urethra is removed.

Now the prostatic cavity is swabbed dry with a hot sponge. Tags are removed, bleeding points are caught and ligatured. A vide V is cut out of the posterior part of vesical neck to include mucosa and submucous tissue. This prevents formation of post-operative bars. A running whip-suture is put on the posterior half of vesical neck fixing the mucosa and also circling the blood-vessels that form a half circle here (Thomson-Walker).

Hagner bag may be inserted instead. A metal catheter is passed per urethra and the urethral tube of the bag is fixed to it and withdrawn. Pull is made on the tube and bag adjusted into the cavity tucking in the mucosa of neck neatly. Tension is maintained on the bag. The bag is filled with fluid, its tube coming by the side of bladder one. Closure of wound. Bladder is carefully cleaned dry, blood clots removed, wound swabbed with antiseptic. A 3/4″ tube with two lateral openings is placed into bladder so as to come out at its top-angle. The rest of bladder is closed by No. 1 catgut by a continuous muscular stitch avoiding mucosa. Over this another suture picks up the areolar tissue. The rest of wound is closed by figure-of-8 interrupted stitches. If the rubber tube is sterilised on an angular

frame it maintains its angle. The tube should not be fixed, but bladder closely sutured round it.

Hagner bag is relaxed after 18 hours. On the second day after operation Hagner bag is removed, urethral tube of bag cut short and pulled out by supra-pubic route.

After operation patient is given 1000 c.cs. of N. saline under the axilla 30 c.c. of ½ per cent. novocain may be added to it.

Four doses of ½ c.c. pituitrin is given, first at midnight then every 6 hours up to four doses. This prevents distension.

1/10 gr. morphia may be given for pain and repeated if necessary. Castor oil on the third morning is given for clearing bowels. On the fourth day bladder wash with Pot. Permang. 1/5000 is given. On 6th day supra-pubic tube is removed if not already done Supra-pubic caps are used for draining fluid away the skin and suture line being smeared with zinc ointment.

Carcinoma of Prostate.

20 per cent. of cases with symptoms of enlarged prostate turn out to be cancer and in about 50 per cent. of these there may be benign adenoma in addition. In some others there may be fibrosis causing bar or contraction of vesical neck.

Pathology.—Cases rarely come in the early stages. It is more common in the posterior lobe. It starts as a small nodule usually progressing slowly, sometimes more rapidly. The prostatic capsule is remarkably resistant to invasion. The cancer cells invade the region of seminal vesicles then actually involve them and vasi for some distance. The trigone is next invaded but the bladder and urethral mucosa resist for a long time. Hence ulceration

of bladder is late and one rarely sees a fungating growth even then. Next pelvic glands, tissues and pelvic bones become involved. It is liable to cause hyperostosis in the bone and shadows are denser, in the later stages, but rariaction in the earlier stages.

Extensive infiltration may be made out by rectal examination. It rerely advance downwards though sometimes the bulb may be involved.

The type is Adeno-carcinoma.—(1) Typical adenocarcinoma, small acini packed together with little stroma between. (2) Acini may be elongated with complicted branchings with a greater amount of a stroma. (3) Intraacinar proliferation of cells. (4) Frankly invasive with masses of cells invading adjecent tissues.

Hardness may be due to original fibrous tissue, secondary development of fibrous tissue (scirrhus) and proliferative tissue reaction.

Clinically growths may be very hard or softer in rapidly growing infiltrating types fibrous tissue formation being poor.

Section—nacked eye.—Hard type cuts as a hard gritty mass, section shows yellowish dots and lines. Softer types resemble adenoma and require microscopic examination for diagnosis.

Symptoms.—Age, under 50, 2 to 3 per cent.; 50-60 show 20 per cent.; 50 per cent between 60-70; 25 per cent. in people over 70. It is very rare before 40. Relatively slow in growth, patient living from 3—6 years after appearance of growth. Difficulty and frequency of urination is the first symptom, pain a little later in 35 per cent.

Hæmaturia occurs only in 4 per cent. Obstructive urinary symptoms predominate due to benign hypertrophy or carcinomatous contraction.

Later loss of weight occurs. In advanced cases hæmaturia in 17 per cent.

Pain at first local, later referred and radiating, is present. In some pain may occur before urinary symptoms. The condition on admission usually resembles prostatic hypertrophy.

Examination.—Rectal-degree and extent of induration are charted. Nodular swellings are marked out. The condition of upper notch and median furrow is noted. If doubtful residual urine is noted and cystoscopy and urethroscopy with antigrade telescope is done, ulcerations projection noted. Palpation of prostate against the shaft of cystoscope is done, especially the sub-urethral part below verumontanum.

X-ray pictures of prostate and pelvic bones should be taken.

Diagnosis.—Induration nodular and irregular and of third degree like cartillage is very suggestive especially with persistent pain. The notch and groove if obliterated and part feels hard between the finger and shaft of cystoscope and in the absence of middle lobe enlargement by cystoscopy is likely to be carcinoma. If the indurated swelling is below the level of ejaculatory ducts it is in the posterior lobe the common site for carcinoma. In the absence of peri-prostatic fibrosis any induration of nodular type in the prostate is likely to be carcinomatous. Such indurations should be charted and when prostate is exposed should be felt and viewed carefully and if necessary a frozen section should be examined.

Treatment.—Where the induration is confined within the capsule radical excision of prostate is done. Perineal incision is a little longer When prostate is exposed, the posterior layer of Denonvilliers fascia with rectum is

pushed well back and the levators ani are well retracted laterally. A transverse section between the apex and compressor urethræ is made into membranous urethra. The tractor is introduced. Next blunt dissection on the lateral sides is made to expose the pelvic fascia as it passes from prostate to the levator muscle. By knife-dissection pelvic sheath is separated from prostatic capsule. The apex is completely separated. Then section of urethra is completed. Now traction on the tractor assists in separating the sheath carefully from the prostate as far as the vesico-prostatic junction. One blade of tractor is turned up, palpated and section is made over it. This is enlarged and exposes the trigone and ureteral openings.

Blunt dissection on the sides of the neck is done and incision enlarged. Next section of mucosa, trigone is made half inch in front of ureteral openings. An anterior retracter pulls away the front parts of the dissection. Section of trigone and traction on the prostate exposes the vesicles. Further blunt dissection is done in this area to expose ureters and vasi. The ureters are carefully retracted up. The vasi are hooked up and clamped and sectioned off. Next the blood supply of vesicles are exposed as two pedicles on either side, clamped and cut. The vesicles are pulled down. Further blunt dissection enables one to remove the whole mass. The clamped parts are carefully ligatured and bleeding points also ligatured.

Now the anterior part of vesical neck is sutured to membranous urethra, then the lateral sides. A large sized rubber catheter is passed in and the rest of wound is closed in a longitudinal direction. Then the surrounding tissues are brought together. The levators by couple of stitches to support the bladder suture line. Wound is closed with a lateral drain. Catheter is kept in 7 days. Continuous drainage of bladder is done. In reinserting a styleted

catheter is passed guided by finger in rectum so as not to damage suture line. Hydrotherapy is done.

The anterior pelvic sheath contains blood and nerve supply of compressor urethræ and should not be damaged. This part forms the pubo-prostatic ligaments. In spite of this some incontinence may be present in these cases while standing and in others it may be present also in the nights. Damage to compressor urethra should be avoided. Operation is useful only in the early cases.

Radiumtreatment.—1. Perineal exposure of prostate is done using urethral prostatic tractor. The Denonvilliers fascia is cut into at the sides and opening enlarged separating the two layers. 20, one mg. needles are inserted into prostate and vesicles so that each needle acts on one cm. of tissue, one line of insertion being placed at the periphery of growth, 2 needles 12·5 mg. are inserted into the depths of lateral lobes, 3 needles of 10 mg. inserted into the depth of gland. The rectum is protected by lead sheeting and rubber so that it could be removed through the lateral part of wound. Except one limb of wound the rest is sutured. The opening is packed with gauze, allowing the threads of needles to come out. The 12·5 needles are removed after 10 hours, 10 mgs. after 18 hours and 1 mg. needles after 48-72 hours. An indwelling catheter is left.

2. Supra-pubic method is used in cases with marked frequency and difficulty of urination. A good exposure of neck is done and 1 mg. needles are inserted one per cm. of tissue. Total in both 3000 mghrs.

3. *Through urethra.*—100 mgs. in silver tubes fixed to the end of cystoscope (straight) allows it to be applied carefully to the part required and outer end is clamped to the table. The beak 3½ cm. of a curved metal catheter containing radium tubes can also be similarly applied being

guided by a finger in the rectum. This is done after anæsthetising urethra with 5 per cent. novocain.

Rectal applicator—containing two such tubes 200 mgs. can be applied guided by finger to parts of prostate per rectum for one hour a day. The next application should be in another part not closer than 5 mm. away from first point. Charting of areas exposed should be done.

Complete course.—1600-2000 mghrs. per rectum, 600-800 per urethra, 400-600 mghrs. to the trigone, *i.e.*, 3000 mghrs. in all.

Gold radon seeds of 0·5 mcr. may be implanted and left 1 per c.c. of tissue.

In cases of obstruction later, conservative removal of lateral lobe and median bar can be done or as a palliative operation in others.

Sarcoma of prostate is found usually in younger people before 40. 36 per cent. are round celled, 29 per cent. spindle cell and the rest a variety of sarcomas as myxo-sarcoma, leiomyosarcoma, etc. The tumour is usually large when seen, rapid in growth invading structures for great distances. Usually fatal in 12 months and in the first two decades in 6 months.

Symptoms.—Often tumour is fairly large before symptoms appear in the young. But in old people difficulty in urination may be seen early. Difficulty in urination and defecation appear later, hæmaturia, blood per rectum later still. Pain lancinating and radiating is seen fairly early. Oedema of legs from lymphatic obstruction.

Rectal examination.—A large mass is felt in the region of prostate, soft or elastic and later palpable in the hypogastrium but upper limits of mass can't be felt per rectum.

Diagnosis.—In children a mass felt per rectum in the region of prostate. Later this pushes the bladder neck and frequency and difficulty of urination and defecation from pressure on rectum with some bleeding. Later still a mass is felt in the hypogastrium and a large mass per rectum.

In adults it is more difficult as symptoms of urinary obstruction may appear before mass could be felt per rectum. In some cases mass may be firm suggestive of carcinoma. But the rapidity of extension is greater and mass becomes very large in later stages and involves adjacent structures more rapidly. The elevation of trigone is much more marked and quite different from carcinoma and rarely ulcerates into it.

Four groups can be made.—(1) Primary in prostate. (2) Involving both prostate and seminal vesicles. (3) Arising in the region of vesicles and not involving prostate (supra-prostatic) giving rise to huge retrovesical tumours form the majority. (4) Arising in ischiorectal fossa.

Treatment.—Radium therapy followed by deep X-ray treatment. But ends fatally. This is only for temporary improvement.

Prostatic Bars.

Median Bar
- (1) Congenital
  - Muscular
  - Connective tissue.
- (2) Acquired
  - (*a*) Acquired Inflammatory 60% of Median bar.
    - submucous
    - muscular
    - periacinous.
  - (*b*) Glandular hypertrophy.

This type is usually inflammatory resulting in (1) posterior bar 60 per cent., (2) circular contracture of neck 15 per cent., (3) anterior bar occasionally.

The disease is the result of chronic prostatitis in a large per cent. of cases and a fair number with definite cystitis. A good number may give a history of difficulty of urination from infancy.

Pathology.—In the majority there is a thickening in the middle portion of prostate posteriorly, forming a definite raised bar in front of trigone. The mucosa is normal beneath which an extensive mass of fibrous tissue with admixture of muscle and deeper down inflammed glands sometimes with definite hypertrophy is seen. Occasionally the bar is made of mostly muscle tissue of neck.

In some the bar may be elevated and thin like a valve and a deep pouch may be present in front of it in prostatic urethra where the tip of instruments is likely to be caught. Usually there is a sulcus on either side between it and lateral walls. Sometimes this fibrosis may pass circularly causing contracture of neck. Occasionally a bar may be present in front of prostatic urethra but it is less pronounced than the posterior bar.

Sometimes these bars may contain definitely enlarged glands of the prostatic median lobe, or the Albarran subcervical glands. There may be no hypertrophy of other parts of prostate.

Round cell infiltration is seen in 35 per cent., chronic fibrosis in 12 per cent., muscular hypertrophy in 2 per cent. (congenital type), others are inflammatory. 40 per cent give a history of gonorrhœa.

Symptoms.—Frequency in 82 per cent., pain in 50 per cent., difficulty in 49 per cent., small weak stream in 40 per cent., urgency in 24 per cent., occasional complete retention in 11 per cent., incontinence in 7 per cent. Pain may be in vesical neck, posterior urethra, perineum or penis. Chronic

irritation and irritability in posterior urethra is often complained. Sexual symptoms are rare.

Residual urine is much less common than in hypertrophy 50-300 c.cs. In 40 per cent. urine may be infected.

Cysto-urethroscope.—Median bar seen in 60 per cent., trabeculation in 59 per cent., hypertrophy of trigone in 22 per cent., cellules and diverticula in 17 per cent., contracted vesical orifice in 15 per cent., calculi in 11 per cent. A fibrous ring or bar can be seen and finger palpation against instrument per rectum whould show thickening near vesical outlet.

30 per cent. of these cases show impairment of kidneys and chronic uræmia.

Diagnosis.—History of frequency, difficulty of urination of long duration and presence of an indurated small prostate and the bar, trebeculation seen by cysto-urethroscope fixes diagnosis. Chronic low grade trberculosis may resemble this but a careful examination and cultural results distinguish the two.

Obstructive cysts in younger people give rise to similar symptoms but these are distinguished by direct visual examination by cysto-urethroscope.

Prostatic valves, slight prostatic enlargements have to be similarly excluded.

Treatment.—Prostatic massage, dilation, instillation of diffusible dye antiseptics, intravenous injection of iodine, urotropine with diathermy massage of prostate and protein therapy may do good.

Operative.—Punching out the bar after dessicating with diathermy needle by Kirwin's Punch (outer sheath, inner tube with McCarty lense system with passage for diathermy needle, and a cutting tube that passes between the first

two tubes). After needle dessication, the piece is punched out. Or use a Wappler and McCarty modification of Young's punch. After punching, bladder is washed out and a 24F catheter with whistle-tip is left in. Urinary antiseptics and hydrotherapy, etc., carried out.

The view now accepted about the sphincter at the vesical outlet is the one explained by Young and Wesson. The maximum diameter of posterior urethera is 1 cm. and the distance between internal meatus and Verumontanum only 1·5 cm. One can understand that any small deformity in this region is liable to produce far-reaching consequences especially in old people. Excluding the frank adenomatous hypertrophy, there are other conditions which may give rise to similar symptoms. It is in the type called by French Urologists "prostatism sans prostate" and by Americans as "prostatic bar" that operations per urethra, "punch operations," are very successful. Either the McCarty prostatic electrotome (wire loop) or Kenneth Walkers diathermy punch (Genito-urinary Manufacturing Company, Ltd.) should be used. If these are not available a supra-pubic cystotomy and diathermy cauterization after cutting out the bar may be done. But for enlarged prostate enucleation of the adenoma is better than punching operation.

Electro coagulation followed by punching, is indicated in :—

(1) Only bar cases with no prostatic enlargement or only slight.

(2) Same preliminary and post operative care as regards renal function has to be undertaken.

(3) Where with enlargement usual operative enucleation treatment is contra-indicated and in some cases of scirrhus carcinoma punching operation may be done for only relief of obstruction.

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Spontaneous Pneumothorax.

By R. Viswanathan, B.A., M.D.,M.R.C.P. (London).

Definition.—The name is given to the condition where air enters the pleural cavity mostly as a result of spontaneous rupture of the alveolar wall.

As early as 1856 M'Dowell [1] described cases of pneumothorax occurring not only in people with pre-existing pulmonary disease but also in apparently healthy individuals. Stevens [2] described the case of a clergyman who had an attack in church. Cayley [3] and Hale White [4] have reported cases of pneumothorax occurring during the course of typhoid fever. Cases of hæmopneumothorax have been recorded by Pitt [5] and Rolleston. [6] Recently Kjaergaard [7] has collected 51 cases or spontaneous pneumothorax in the apparently healthy. Seven cases have come to the notice of Burrel [8] six of whom recovered completely, the remaining one dying as a result of bilateral pneumothorax. Though I have seen several cases of pneumothorax in tuberculous patients, only recently did I come across two cases in apparently healthy individuals, reports of which are given below.

Aetiology and Pathogenisis.—Air may enter the pleural cavity from the outside atmosphere consequent on a perforating injury of the chest wall, or from the abdominal viscera following perforation through the diaphragm, or from the lung through rupture of the visceral pleura. We are not concerned with the first two groups of causes. As regards the third, one is justified in saying that spontaneous pneumothorax is not at all an uncommon occurrence. Pulmonary tuberculosis is the commonest cause. In some rare cases it occurs as a very early sign of commencing lung lesion. More often does it occur during the advanced stages of phthisis.

It might also occur as a complication of such non-tuberculous diseases of the lungs as carcinoma, abscess, gangrene, emphysema, etc.

The occurrence of spontaneous pneumothorax in the apparently healthy is in all probability due to rupture of an emphysematous bulla, as shown by six of the cases collected by Kjaergaard, which came to autopsy. But it is a matter for surprise that pneumothorax rarely occurs in general emphysema. The mechanism of production is something like this. A valvular opening connects the vesicle with a bronchiole in such a way that air can enter the vesicle but cannot leave it. The bulla gets more and more distended when it bursts ultimately, resulting in the free passage of air from the lungs to the pleural cavity. In most cases the opening closes as the vesicle collapses, and the accumulated air soon gets absorbed. But if the valvular opening persists with the integrity of the valve action maintained the interpleural pressure rapidly increases causing considerable discomfort to the patient. If not relieved by repeated aspiration of the air, the patient may die of shock or insufficient pulmonary ventilation. In some cases a fistulous free communication may persist, in which case there might occur a permanent pneumothorax causing no evident distress to the individual.

It is more common in men than in women as shown by Kjaergaard, 36 of whose 51 cases were men. "36 occurred between 20 and 40 years of age, 33 occurred on the right side, 17 on the left and one bilateral." Both the cases which came to my notice were men of apparently strong constitution 24 and 22 years of age respectively. It was on the right side in one and on the left side in the other.

Symptoms.—It is quite probable that there are a large number of cases of pneumothorax in which the condition is partial. They go unrecognised owing to the absence of

marked symptoms. In some cases of advanced tuberculosis with considerable pleural adhesions, partial pneumothorax might occur without causing any additional distress to the patient. Ordinarily when complete pneumothorax occurs spontaneously the patient complains of sudden pain on the side of the chest affected, with a varying amount of dyspnoea. If there is considerable increase of interpleural pressure with displacement of the mediastinum, there might be cynosis as well. In some rare cases death might occur as a result of shock or due to want of oxygenation of the blood. Most cases make an uneventful recovery, sooner or later as the air gets absorbed. But if one of the blood vessels also rupture along with rupture of an emphysematous bulla, fatal haemo-pneumothorax might occur as in the cases reported by Rolleston and Newton Pitt. Burrel is of opinion that, if effusion complicates spontaneous pneumothorax, there is certainly a pre-existing disease of the lung most probably tuberculosis. In the apparently healthy, effusion hardly ever occurs. Both the cases reported below recovered rapidly and completely as the X-ray plates would show.

Case 1 M. O. R.—A medical student aged 24 years apparently in the best of health, got a sudden catch over the right side of chest while trying to bend back probably in the act of yawning. I saw him about twelve hours after the incident. He had considerable pain over the whole of the right side of the chest, difficulty in breathing and inability to lie on the right side. I proceeded to examine him with the biased idea that it would be a case of pleurisy. But on systematic examination I found deviation of the trachea to the left, displacement of the heart to the left, absence of Vocal fremitus and Vocal resonance, with tympanetic note on percussion and absence of breath sounds on the right side. *Bruit-diaru* in so characteristic of pneumothorax also was present. X-ray showed complete collapse of the lung on the right side. Owing to his being in distress, I removed one

thousand c.c. of air which gave him almost immediate relief. X-ray ten days later showed almost complete absorption of air from the pleural cavity. The lungs were apparently normal nor did he exhibit later any symptoms pertaining to disease of the lung.

Case 2.—A deck hand aged 22 years got a sudden pain on the left side of the chest during the ordinary course of his duties. He was sent to Royapuram hospital with a diagnosis of pleurisy with effusion four days later. X-ray examination revealed partial pneumothorax on the left side. He had no distress whatsoever. He showed complete absorption in X-ray ten days later. Lungs were apparently in a healthy condition.

I consider both cases to be spontaneous pneumothorax occurring in the apparently healthy, possibly as a result of rupture of emphysematous bulla.

Diagnosis is easy when the pneumothorax is complete. Hyper-resonance with absence of breath sounds and displacement of mediastinum to the opposite side are quite characteristic. It may be difficult if it is encysted as in advanced phthisis. If there is only partial pneumothorax confined to the upper portion of the pleural cavity as in the second of the cases reported above, the relative difference in resonance between the upper and lower portion might lead to the mistaken diagnosis of pleural thickening or effusion at the base. X-ray, of course, will clinch the diagnosis.

Prognosis depends on the aetiological factor. When it occurs in the apparently healthy, recovery is certain except when it is associated with fatal shock, or fatal haemorrhage. When it results from carcinoma, the result is of course hopeless. Pyopneumothorax resulting from rupture of an abscess will often recover after energetic treatment. When it occurs in the early stage of tuberculosis, it might be consi-

dered as a desirable accident since it will produce a necessary collapse of the lung. In the advanced stage it often results in pyopneumothorax which makes the prognosis of the condition worse.

Treatment.—If it occurs in the apparently healthy no treatment is required unless it gives considerable distress to the patient when aspiration of air is indicated. In acute tuberculosis it is advisable to maintain the collapse of the lung with refills. But if pyopneumothorax occurs, Burrel advocates aspiration and washing out of the pleural cavity with Dakin's solution. In resistant cases obliteration of the cavity can be done only by resorting to thoraco-plasty.

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Some Biochemical and Sociological factors in Health and Disease.*

By C. Muthu, M.D., M.R.C.S., L.R.C.P.,

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In the course of an investigation to discover the cause and cure of disease, the Medical profession is brought face to face with two main schools of thought, the Bacteriological on the one hand, the Biochemical, Sociological and Psychological Schools on the other.

Bacteriology came into prominence more than fifty years ago when Robert Koch discovered tubercle bacilli in connection with pulmonary tuberculosis, and ever since it has profoundly dominated every phase of medicine, and the etiology, diagnosis and treatment of almost every disease. When we survey the work of bacteriology during these years calmly and dispassionately, we are bound to admit that the germ theory has not offered a complete explanation of disease. It has not covered more than a fraction of the field of pathological phenomena. A large number of cases of diseased conditions cannot be shown to have any relation to the activities of micro-organisms. Besides, in view of the disappointment that has followed any attempt to cure disease by the destruction of pathogenic organisms, we are obliged to conclude that the sphere of bacteriology has its limits, that it has served its purpose as a stepping stone, the vantage ground from which we see wider fields where deeper factors than micro-organisms are seen to be working in the causation of disease. Here I would draw your serious attention

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to the marvellous advance the young science of Physiological Chemistry has made during the last few years. What a wonderful pathway it has made, what a glorious vision it has revealed of the many complex chemical processes and reactions that are daily going on in the laboratory of the living organism, by which the food we eat—the proteins, the carbohydrate and fats are smoothly and rapidly transformed and assimilated into the blood and tissues with a calm serenity and amazing regularity. It has shown among other things four important principles :—

(*a*) Life's processes and its chemical reactions in the human body are more deep, more subtle, more complex than what the germ theory cares to admit or explain.

(*b*) To strengthen the body's resistance to infection is much more profitable than trying to destroy infection.

(*c*) The study of the chemistry of the body and its various chemical processes and metabolic activities enable us to understand and estimate the importance the soil plays in health and disease so that we can truly say that nutrition is more important than infection, the soil is more important than the seed.

(*d*) Biochemistry has further shown that the soil or man's constitution is made up of what he takes and absorbs into his system, *viz.*, the fresh air, the sunlight and well balanced food, which are the only source from which the internal organs receive materials necessary for the elaboration of their various secretions, hormones, enzymes and other functional activities and for the building of a natural, harmonious bodily health ; and that if there be any deficiency (sometimes excess) of protiens, vitamins and mineral elements in the diet we take the body suffers degenerative changes in the cells which ultimately lead to pathological condition and disease. Sociology has confirmed the findings of Biochemistry, and has gone a step further and shown that man's environment and his

social condition—the air he breathes, the food he eats, the drink he takes, the wages he receives, the house he occupies, the rest and exercise he enjoys—these living conditions go to make up his soil or constitution and profoundly influence his health and disease.

Psychology takes a step further still on a higher plane, and shows that mind has a profound influence over the body, and that mental and emotional disturbances tend to derange the nervous and digestive systems which bring about a morbid condition we call disease.

At the time at our disposal this evening we can only take a cursory glance at some of the biochemical and pass lightly over the sociological and psychological factors that govern health and disease.

Psychological Chemistry has stressed the fact that man's well-being depends upon a properly balanced nutrition which in turn is dependent upon four essential factors. To use an ordinary illustration, just as for the smooth running, a motor car requires four things—air, water, oil and petrol—so, for the normal health and efficiency, the body requires proteins (with carbohydrates and fats), vitamins, endocrine secretions and mineral salts.

Proteins are body builders and stimulate the body metabolism in general. While a certain amount of protein is necessary, a rich protein diet clogs the system and places a great strain upon and weakens the digestive organs. Roughly speaking, the Europeans are apt to take too much protein, and the Indians too much carbohydrates and sweets.

Vitamins, though elusive and found in minute quantities are necessary to life and for its growth and development.

The normal activities of endocrine organs depend upon the protiens, the vitamins and mineral salts taken in man's daily diet.

The mineral salts give stability, prevent putrefaction, rebuild broken down cells, enter into the manufacture of digestive juices and generate electricity. J. Foster has proved that animals fed on meats which have been deprived of their salts could not live more than twenty days. In fact these tissue salts which are twelve in number are so important in the animal economy that life is impossible without them. All these four set of factors are inter-related, and their activities cannot be readily separated from one another. For instance, vitamins introduce the porteins and minerals into the body, and enable them to be easily assimilated into the system. Both A and D vitamins work together in building up the body reserve against infection. Phosphates of calcium and magnesium control the formation of lecithins and albumins Vitamin D enables the young child to utilise calcium and phosphorus. Both parathyroid and suprarenal glands influence calcium metabolism.

A well balanced diet containing all these four factors in right proportion go to promote a sound body and robust health. On the other hand, faulty diet means faulty nutrition and impaired metabolism which eventually leads, as McCarrison has pointed out, to physical deterioration of the individual and the race.

The civilised man has tampered with his food in many ways. Eating refined and polished foods, soft and pappy foods, tinned and frozen foods, devitalised and adulterated food he comes to suffer from lack of vigour and resistance, from physical defects and malnutrition which sooner or later culminate in various diseased conditions. When we consider that even small deviations from natural food may cause profound endocrine disturbance and changes in the finer structures of living tissue, and in chemical reactions and metabolism, we can understand why most people, both children and adults, in civilised countries suffer from physical and mental ill-health,

In addition, India suffers from an impoverished soil which is greatly deprived of the salts and materials necessary for the normal growth of the plant, the vegetable and the cattle, and hence the nutritive value of the food raised from such a poor soil is considerably lowered—much to the detriment of the physical health and development of the Indian. Thus, the study of biochemistry has well brought out the intimate relation that exists between faulty diet and disease. Scurvy, with its attendant evils, such as oedema, hæmorr hage, nervous symptoms, was the first to be recognised as a deficiency disease, which was followed by other affections, such as rickets, beri-beri, pellagra, keratomalacia, cretinism, myxoedema, goitre, gastro-intestinal disturbance, etc. Besides these, there are many ill-defined conditions of ill-health and border-line cases of malnutrition, interruption of growth, irritability and nervousness, conjunctivitis, night blindness and other affections of the eye, dental decay, adenoids, enlarged glands, skin disease and many other affections which are due to food and vitamin deficiencies and disordered nutritions.

Calcium starvation is associated with many morbid conditions, such as joint trouble, rickets, tuberculosis, arterial hypotension, dental caries, epilepsy, tetany in eclampsia and pregnancy. Sir James Barr found that one of the earliest signs of pneumonia is diminution of lime salts in the urine. Deficiency of iodine brings thyroid disturbance and all the evils connected with thyroid deficiency. In fact, the symptoms of thyroid degeneration are so extensive as to affect almost every tissue and organ of the body and almost every civilised family.

As you know, the deprivation of fat-soluble vitamin A develops rickets, osteomalacia, or keratomalacia in infants. The lack of water-soluble B is responsible for beri-beri and polyneuritis, while the deficiency of Vitamin C is associated with scurvy, of protein with pellagra. Dietetic deficiencies, as McCarrison has proved, lead to many gastric and intestinal derangements,

such as dilatations of the stomach, gastric ulcer, colitis, dysentery, etc.

Endocrine deficiency profoundly affects the metabolism of the body, and growth and nutrition. The insufficiency of parathyroid is connected with tetany, of pancreas with varying degrees of diabetes, of deodenum with intestinal disturbance. Deficiency of endocrine and sexual organs cause general depression, melancholia, neurasthenia, and many other forms of neuroses. The deficiency of vitamins affects the efficacy of all the endocrine organs, and through them brings about a larger circle of disorders which result in degenerative changes in every organ and tissue of the body. So, as biochemistry unravels more and more the maze of biological, the metabolic and chemical processes and reactions that are silently going on in the human body, the number of deficiency diseases will increase more and more, till it will embrace a wide range of every diseased condition under the sun.

Sociology has further advanced our knowledge of man's environment in relation to his health and disease. Nothing lowers the vitality and physical efficiency of a people as poverty, wrong feeding, over crowding, insanitation, poor wages and slum conditions. The European part of every Indian town is much more healthy and free from any outbreak of cholera or plague, because it is more wholesome and sanitary than the Indian part which is generally overcrowded and insanitary. When you clear the areas of slum dwellings, you clear the areas of disease and bring health to the community as seen in cities like Edinburgh, Glasgow and London. You Improve the sanitary condition of the people and raise their economic standard, you at once lower their incidence of disease. In fact, when we study the social and economic condition of civilised countries, we become convinced that the people who are best nourished and enjoy the most sanitary and hygienic surroundings show the lowest incidence and mortality from a disease like tuberculosis. No wonder that countries like

England, America and New Zealand have found out by experience that the prevention of disease can only be brought about by giving more and more attention to improving the welfare of people and raising the standard of their social, economic and hygienic condition. Facts like these compel us to see that if the people in India are only half alive, it is because of their bad sanitary and poor living, and that if we have intention to eradicate disease from this country, the only radical way is by giving serious attention to the improvement of the social, sanitary, economic and nutritive condition of the people. If not, the average expectation of life which is now only 22 years will continue to get less and less and the degeneration of the race worse and worse every year.

Psychology strikes a higher plane and confirms the experimental, clinical and historical finding of the biochemistry and sociology. Behind micro-organisms there is metabolism, and behind metabolism there is mind. The influence of mind through the endocrine glands is a profound factor in the etiology and treatment of disease. It is well known that cases of cholera, bubonic plague, etc., can occur through sheer fright or nervous fear. Mental shock and depression can cause such abnormal changes in the body metabolism that cases of tuberculosis caused by some mental disturbance present a grave prognosis. This is historically proved in the case of young ladies of the Victorian age who, when thwarted or disappointed in love, went into a decline, which is another name for consumption, and succumbed in spite of all the efforts made to save them. Strong emotions like fear may affect the nervous system directly, causing inhibition of gastric and other digestive functions. Nervous worry has been recognised to have the effect of impairing gastric and secretary functions and of bringing about alimentary toxæmia. On the other hand, psychology recognises the beneficial effects of such happy emotions as faith, hope, confidence, affection, love, laughter, cheerfulness—which have a calming and smoothing influence

over the mind, stimulate the normal activities, neutralise the toxins and enhance the nutrition and the health of the body.

In conclusion, to put briefly:—

1. The study of life's processes in the light of biochemistry, sociology and psychology gives us a new angle of vision, by which we see that almost all diseased conditions can be traced to deficiency in some food factors such as proteins, vitamins, endocrine secretions and mineral salts.

2. More can be done to maintain health through dietary reform by supplying these various deficiencies than by any other agency we know of.

3. Therefore the study of nutrition and the nutritive value of Indian foodstuffs is the most crying need of the day.

4. Wherefore if we, medical men, would give more attention to the tremendous part man's nutrition and his soil play in his every-day life, I am certain we would have more success in the treatment and prevention of disease.

Life Insurance and Medicine.*

By Theodore Thompson, M.A., M D., F.R.C.P., F.R.C.S.

The subject I have to bring before you is a practical one and is of importance, because the medical examination of a proposer for life insurance is bound to fall to the lot of everyone whether engaged in consultant or general practice. Life insurance may be obtained either after medical examination or without medical examination. The latter method is becoming more and more popular since many people have a great aversion to being medically examined; others feel they have no time for a medical examination, and a certain proportion feel they will get their life insurance more easily without being medically examined, because they think, whether rightly or wrongly, that they have some defect which would be brought to light by medical examination. The proposer, however, who seeks life insurance on the non-medical scheme has to fill up a proposal form consisting of many searching questions as to his family and personal history. If he states he has a medical attendant, the latter is always asked to give an account of his attendance on the patient, while the two friends, whose names are given as references, are asked to tell what they know about his past and present state of health.

Life insurance companies may make considerable losses by taking cases without medical examination. I recently examined a proposal form of this kind, in which the proposer said he was in perfect health and that he had no medical attendant. One of his friends, however, mentioned that he had been attending a certain doctor for bronchitis and when reference was made to the doctor, he stated, that he had been attending the life for three months for progressive pulmonary tuberculosis with hæmoptysis and night sweats. Needless to say this proposer was refused.

* Presidential Address of the Medical Society, in the Bearsted Theatre, October 5th, 1933.

Medical men are employed by life insurance companies in various capacities. The first is the Chief Medical Officer at the Head office of the insurance company, who has to look over the medical reports sent in by the other London examiners and those from the provinces and give his opinion on each, and may also have to examine especially difficult cases. Secondly there is a regular medical officer at the chief branches in big provincial towns. These men are usually chosen from the consultant staffs of the local hospital. They examine the great majority of cases in their particular district. Thirdly there is the occasional examiner employed in their town or country. Fourthly there is the proposer's own private medical attendant. The latter may be asked to fill in the medical attendant's form and he is told that an examination of the proposer is not required. All he has to do is to say what he knows of the proposer's health and family history. Many conscientious medical men think that they cannot fill up such a form without thoroughly examining their patient, but the insurance companies do not want this, and the form should be filled up in the best way possible; the private medical attendant merely answering, "I do not know," if unable to answer one of the questions. In other cases the medical man may have to make a full examination of his own patient and here it is possible that a conflict of duty may arise. During the examination a doctor must remember that he is, for the time, a servant of the company and must give a report on his own patient exactly similar to that which he would have given upon a stranger. He must not give way to any suggestions on the part of the patient that any of his previous illnesses should be glossed over. Many varieties of proposers present themselves for life insurance. First of these is the anxious proposer who plies the examiner with question as to the result of his examination and wants to know if he is a first-class life, as his wife will be so anxious to hear. The medical examiner should never disclose the result of his examination: if he does so he nearly always gives a great deal of trouble and anxiety to the Office. On almost

all examination forms it is prominently stated that the results of the examination, whether favourable or otherwise, must not be communicated to the proposer, agent or any third party. The company, for reasons which are not known to medical examiners, may decide to load or decline the life and if the medical examiner tells the proposer that he is a first-class life, a very difficult situation arises. Secondly there is the proposer who cheerfully tells the medical examiner that he has come to get a full opinion about his state of health, and that he does not contemplate taking out an insurance at all. Here again the examiner must be firm and not disclose the results of his examination. Thirdly, there is the angry proposer who may have applied under the non-medical scheme but has been told that he must be examined, or possibly has been examined in the provinces, and has to come up to Loodon for a second examination. Such people think they must be seen immediately they enter the house, and if kept waiting, become extremely annoyed. These people require a good deal of tact at the medical examination if it is to be proceeded with satisfactorily. Fourthly, there is the virulent type of proposer who, when the examination has apparently been carried out without any hitch, will write to the Company to say that he has been extremely badly treated and that the examiner has been most insulting to him. One youth whom I examined wrote a long letter to the company saying that he had been grossly insulted. Apparently his complaint was that when I asked him to stand on the weighing machine I did not say please. Lastly, there is the nervous proposer who forgets the age of his mother and father and most of the details of his family history. His pulse rises to 100 and 120 and the heart beats irregularly and tumultuously. In these cases there is often a cardio-respiratory murmur and the systolic blood pressure rises to 150 though the diostolic may remain at, or nearly, normal. The hands tremble violently and he is quite unable to pass urine.

These cases require to be reassured and calmed down and often a little enquiry about his work or family will put him at

ease. Again there is the female proposer. Many women are now taking up life insurance and the importance of full examination cannot be stressed too much. Many women who come up for life insurance are reluctant to be thoroughly examined and it used to be the custom of the medical examiner not to examine below the waist, but I have recently had cases where a large fibroid tumour of the uterus and ovarian cysts were present although the proposer seemed to be quite unaware of their presence. Whenever possible it is advisable to have a female friend of the proposer in the room as this prevents the proposer being so nervous of the examination.

Fees for medical examinations.—The Chief Medical Officer of large company receives a retaining fee and also receives fees for special and ordinary examination. The regular and occasional examiners are usually paid one guinea for each examination. In 1910 an arrangement was come to by the Life Offices Association and the British Medical Association that there should be a standard fee of one guinea for all ordinary life examinations. In some industrial offices where the total amount is small and under £100 a fee of 10/6 is paid. Of course those practitioners who are not members of the B. M. A. need not abide by these rules and may claim higher fees, but if they do a company need not employ them.

The object of life insurance medical examination is not merely to discover if the proposer is in good health at the time of the examination, but also to discover whether the proposer is likely to live as long as other healthy persons of the same age. It not infrequently happens that the proposer may be rated up for some weakness, disability or occupational risk and being annoyed by this may go to his own private medical attendant or to a specialist who examines him and tells him that he is quite healthy and has nothing to worry about, forgetting that the company is not merely interested in the present state of health of the proposer but in what it may be in 15 or 20 years time. A medical examiner must not conclude that his examination of

the proposer is the only evidence on which acceptance of the risk will depend. The company obtains information on the proposal forms from the friends who are given as references and from the agent and from the proposer's own medical attendant. Special information as to the habits of the proposer may have been obtained and the officials or directors of the company may have private information about the eligibility of the life. The opinion of the risk given by the medical examiner is reviewed by the chief medical officer, the actuary and the directors and may be either altered or reversed upon information of which the medical examiner is often quite ignorant. This shows the importance of refusing to give the proposer any information as to the medical examination.

In some cases the proposer may call on the medical officer and ask to know why he has been adversely dealt with. In such cases the medical officer should say that the medical report is confidential and that he can give no information about it and refer the proposer to the Head Office Officials if he wishes to follow up the matter.

Medical men often go about saying that they have "passed" such and such a proposer for life insurance, but of course this is extremely foolish as the result depends not only on the medical examiner's report but also upon many other factors.

Family History of the Proposer.—Considerable difficulty is often experienced in obtaining the family history and much careful questioning may be needed. Many proposers are now aware that, if they have a family history of consumption and they are young lives, they are liable to be rated up and so they often cover up a death from consumption in the family by calling it pneumonia, broncho-pneumonia, childbirth, debility or decline. In all these cases it is necessary to discover how long the illness lasted, for instance, if the pneumonia or broncho-pneumonia only lasted a week or ten days it is probably not tuberculosis, but if lasted for some weeks or months, tuberculosis is probable. It is always necessary to enquire whether

the proposer lived in the same house as the tuberculous relative. If the proposer is under thirty years of age, but otherwise a good life, a rating of 5 to 7 years is added for a bad family history of tuberculosis. If the proposer is over thirty years of age and an exceptional life he may be taken at ordinary rates even if one or more members of the family have died from consumption.

A family history of arterial disease, death from angina, stroke or arterio sclerosis is important, since it would lead to a rating of life insurance by some years or alternatively asking a proposer to take out an endowment policy payable at sixty.

The *personal history of the porposer* is also most important. On the statements made by the proposer depends the validity of the insurance.

The statements made by him on the proposal form constitute the basis of the contract between himself and the insurance Company. Many proposers are apt to forget their illnesses in the past and to minimise them, but a very good method is to ask the life the name of his doctor and the dates he attended him and for what illnesses and their duration.

Next there is the *insurance history of the proposer*. It is now generally known that a registry is kept by a great many insurance offices and every life that is either rated up or declined is placed on the registry with the papers concerning him available for any subsequent company which receives a proposal. Many proposers wilfully lie about a previous application for insurance which has been turned down. A cabinet minister, now passed away, cheerfully signed a statement saying that he had not been examined for the last six months whilst I held in my hand at that very moment a copy of his medical examination, only three months before bearing his own signature. Even the word of a clergyman may be doubted in this connection. Not only is the registry very valuable in assisting in the assessment of doubtful lives but also very inconvenient for doctors who are trying to gloss over their patients' defects. Only a few weeks ago I had

a perfectly clean medical examination by a doctor upon a proposer, who happened to be his own patient, in which he stated that the heart was perfectly normal and not enlarged. On looking up the index we found that he had twice been rejected by two examiners who had found he had an enlarged heart with mitral systolic and aortic diastolic murmurs. After re-examining the heart the medical attendant said that he undoubtedly did find mitral systolic and aortic diastolic murmurs but in his opinion they were very variable and not always present. Needless to say this examiner will probably not receive any more work from this particular insurance company.

A history of previous lung trouble should also be carefully amplified by the medical examiner. A statement that the proposer suffered from pleurisy five years before is not nearly so valuable as one stating that he suffered from pleurisy lasting six weeks and accompanied by fever and effusion, or on the other hand that he suffered from so-called pleurisy lasting three days in which latter case one might not consider it a pleurisy at all but purely a rheumatic pleurodynia. A history of hæmoptysis is also of considerable importance and if possible the amount of bleeding should be given. If it is merely a streak in the phlegm or saliva it may arise from the teeth or throat, if on the other hand it amounts to as much as a pint or more it is more likely to have come from the stomach. It is moderate amounts, such as an egg-cupful, which are of importance as indicating pulmonary tuberculosis in the past.

If the patient has had consumption and has now recovered from it the case may be insurable at a very heavy extra, but one must always remember Doctor Gee's aphorism, that in giving prognosis in a case of pulmonary tuberculosis there in only one thing certain and that is that the prognosis will be wrong. The fact that a proposer has had tubercular glands in the neck removed in his youth is not now considered a drawback. In

fact, such patients are thought to have a certain amount of acquired immunity against pulmonary tuberculosis

A history of cardiac symptoms should also be carefully enquired into and shortness of breath, attacks of faintness or anginal pains should be carefully noted. Attacks of faintness, though not of much importance in young people, are very significent in middle aged men. In a recent case where a proposer insured for a large sum at the age of 55, to cover death duties, there was a history of syphilis in his early youth without any return of symptoms. The proposer was asked the question as to whether he had suffered from fainting and replied "No." He was standing by his horse in the hunting field some six months later and fell down dead. At the inquest his son somewhat naively remarked that he was rather surprised that his father had been accepted for life insurance six months before as he had suffered from several attacks of fainting before he took out his life policy. Anginal pains are often glossed or denied by proposers and these cases are exceptionally difficult as examination of the heart may fail to reveal any signs of disease although there may be definite narrowing of the coronary artery from atheroma. A history of phlebitis and venous thrombosis must never be neglected as the possibility of a pulmonary embolism occurring later is a most serious one. A history of digestive disorder may indicate that the proposer has either suffered from a gastric or duodenal ulcer, for which he may have had a gastrojejunostomy. The experience of life insurance companies in these cases has been very bad indeed and many claims have had to be met. Each case has to be considered on its merits and a heavy extra is generally required. In case of appendicitis, which have not been operated upon, an extra is required until at least seven years have elapsed since the last attack. When an operation for an appendix has been performed and a large abscess has been present and drainage has been necessary from more than one site an extra is required on account of the risk of abdominal

adhesions and intestinal obstruction in the future. A history of genito-urinary disease is also of importance. The question of any stricture occurring after gonorrhœa must be carefully noticed, while a history of syphilis is of the utmost importance. A very large investigation in this matter has been made by the American Life Offices Association and they have come to the conclusion that the mortality among those who give a history of syphilis is two or three times as great as among healthy persons.

An attack of cystitis may indicate B. Coli infection or an enlarged prostate, and a history of nephritis necessitates a most careful examination of the urine and cardio vascular system.

Personal Examination.—The height, weight and chest and abdominal measurements are taken in every case and a table is generally available showing the average weight of a given height at a given age. It is generally taken that 20 per cent. above or below the average weight may be accepted without an extra. Proposers who are considerably over weight are distinctly bad lives and require an extra with, if possible, a limitation of the risk to the age of sixty. Under weight cases in young people predispose to the risk of phthisis in the early years and are better met by a reducing debt upon the policy. A good chest expansion of 3 to 4 inches is of good prognosis as regards the proposer's life, while a chest expansion of two inches or less, especially combined with a large abdominal measurement, is definitely an unfavourable factor. The examination of the heart is of the first importance. Its size should be carefully determined and the nature of the sounds described. Distant heart sounds may be due to excessive thickness of the chest wall. If a cardiac murmur is present its point of maximum intensity, direction of propagation and character should be stated. A note should be made as to whether it varies with posture or respiration. In many young subjects, who are quite healthy, murmurs are present which do not affect the expectation of life. Especially in nervous young proposers cardio respiratory murmurs, which

disappear when a full inspiration is taken, are to be found, while hæmic murmurs, which are most marked in the prone position, may also occur. Every case of organic cardiac murmur due to valvular disease must be considered on its merits. Some cases of mitral regurgitation may be taken with a small extra. Cases of mitral stenosis are generally uninsurable, not only on the risk of heart failure, but also from the frequent occurrence of embolism in these cases. Aortic regurgitant murmurs are also generally uninsurable. Aortic systolic murmurs may indicate aortic stenosis but more often are an evidence of atheroma and the possibility of coronary disease has to be considered. Aortic aneurysm accounts for a certain number of early claims but a more rigid exclusion of lives with a syphilitic history and a more careful examination of the chest has reduced this loss to the companies to a considerable extent. In cases where there seems to be any evidence of cardiac debility an exercise test should be undertaken, the patient being asked to step up on to a low stool or chair five or six times, the pulse being taken before and after the exercise. In a healthy heart muscle the increase in rate produced by exercise should not be more than fifteen beats per minute and the pulse should return to normal after half a minute. Of late years an examination of the blood pressure by the sphygmomanometer has been asked for in cases of life insurance and a great deal of work has been done both in this country and in America on the value of blood pressure readings in determining the expectation of life. Between the age of 20 and 50 in healthy individuals the blood pressure remains constant with an average of 125 systolic and 80 diastolic. Between 50 and 70 the average increases slightly to 135 systolic and 85 diastolic. It has been suggested that the maximum variation allowable for lives between 20 and 50 should be taken as 150 systolic and 88 diastolic in an upward direction while the lower limits should be 100 systolic and 72 diastolic. In lives between 50 and 70 the maximum allowable should be 160 systolic and 94 diastolic. There is no doubt that an increase in blood pressure arises from

emotional causes at the time of the examination. Many young persons may show a systolic blood pressure of 150 simply due to nervousness. In these cases, as a rule, the diastolic blood pressure is normal. Rapid action of the heart from nervousness or other causes also, as a rule, increases the blood pressure, an increase of 10 of the pulse rate per minute corresponding to a rate of 5 per cent. in the systolic and of 2 per cent. in the diostolic reading. If the high blood pressure is found in any case the heart and blood vessels must be carefully examined and the urine carefully tested for albumen. It has been suggested that the relation between the systolic and diastolic blood pressure is of great importance. Three groups of cases have to be distinguished; firstly, those with a high systolic blood pressure and a normal diastolic pressure. These cases usually occur in young people and are frequently the result of emotion of trachycardia. The prognosis is relatively favourable and the high systolic pressure may disappear. In the second group both the systolic and diastolic pressures are high. These cases tend to occur in older persons and are relatively unfavourable and always require an extra premium. In the third group a normal systolic pressure may be combined with a high diastolic pressure. It is stated that in these cases there is always a considerable degree of cardiac muscular weakness and it is thought that they should be declined. The difficulty in these cases is that so often the medical examiners find it hard to examine the diastolic pressure at all accurately. This factor must be allowed for in considering the relation between the systolic and diastolic pressure.

High Blood Pressure is associated with nervousness, overweight, cerebral thrombosis, hæmorrhage and chronic renal disease. If the systolic blood pressure is over 180 the case should either be declined or postponed. Low Blood Pressure is found in cases of poor physique and low weight and in proposers with a tendency to pulmonary tuberculosis, and in Addison's Disease. If all other factors in the case are favourable,

a low blood pressure down to 95 or 100 systolic does not require an extra, but tubercular trouble should be definitely excluded.

The examination of the digestive system begins with the tongue. Marked leueoplakia should be declined as its frequent association with a past history of syphilis and a tendency to cancerous development make it a most dangerous early sign of disease from a life insurance point of view. Pyorrhœa is very frequent and is not now uncommonly found on certificates as the primary cause of death. This disability is usually met by applying a debt to the policy removable when a dental certificate is obtained that the mouth is in a healthy condition. Abdominal examination should never be overlooked. Slight enlargement of the liver may be detected in cases where heart weakness is suspected or where the habits of the proposer as to alcohol are doubtful. Enlargement of the spleen should be specially looked for in proposers who have been in the tropics or suffered from malaria.

Examination of the nervous system.—The pupil reflex is most important. Some years ago I examined a German, who wished to insure for a very large sum, over £100,000. The only abnormality discovered was loss of the pupil reflex to light. Though syphilis was denied a small scar was found on the penis. I advised that the life should be declined and two years later I heard that he committed suicide in Hamburg. Absence of the knee jerks may be congenital but is usually found with tabes dorsalis or when neuritis from alcoholism or diabetes is present. Infantile paralysis in former years does not call for an extra, unless the paralysis is so severe as to prevent proposers from taking sufficient exercise. Epileptic cases of mild grade can be insured at an extra of from five to seven years.

Fraud in Life Insurance.—Not only has a life insurance examiner to be a good clinician but he must also be on the alert to detect proposers who are trying to obtain life insurance by fraudulent methods. The following are cases which have

come under by personal observation. In one case a solicitor sent his wife up for medical examination. She appeared to be a good life, but when I asked her to allow me to examine her abdomen, she refused to do so, saying she was too busy and it was not necessary. I could only note on my report that a complete examination had been refused. The company accepted her at ordinary rates and six months later she died of sarcoma. However, her brother who was a doctor, wrote to the company saying that four months previous to her medical examination she had been operated upon in a nursing home for sarcoma of the rectus abdominis and her reluctance to display her abdominal scar was thus explained. The company refused to pay on the ground that the fact that she had had this operation had not been disclosed on the proposal form The solicitor widower threatened legal action and wrote abusive letters, but no notice was taken and he eventually let the matter drop.

In another case an Indian doctor died of cancer of the colon six months after his medical examination, but it subsequently transpired that he had had an X-ray bismuth examination of his alimentary tract just before he was examined and as he had not disclosed the fact on the proposal form, payment was refused.

An insurance agent brought his wife to see me for life insurance. She appeared to be a good life, but as she was dressing up I noticed a slight deformity of the right breast and on further examination there was a cancerous lump present, with one or two small glands in the right axilla. Both husband and wife denied knowledge of the lump but she was, of course, refused and sent to a surgeon. The breast was amputated and the axilla cleared, but she died two years later from secondary metastasis.

An interesting case came before me lately of a proposer who died twelve months after examination from cerebral tumour.

He denied any previous illness on the proposal form but reference to his medical man revealed the fact that the proposer had consulted a nerve specialist four years before he made his proposal. The nerve specialist was called upon and stated he had seen the case and found that he then had a slowly growing cerebral tumour and had advised him to have an operation.

One of the most blatant cases I have come across was one in which a man took his wife to the throat department of a general hospital for hoarseness and was told that she had inoperable cancer of the larynx. The very next day he sent her up to me for life insurance.

Annuity Business.—It sometimes happens that when an annuity is being purchased the life considers that he should have more favourable terms (*i.e.*, a large annuity granted to him) on account of the impairment of his health. Here the life examined, instead of minimising his previous illness and general ailments, is likely to exaggerate them. Annuitants have a better expectation of life than the average person owing to the freedom from worry and the desire to live long For this reason it does not follow that a man, who has had a certain number of years added to his age for a life insurance policy, can except to have the same number of years added to his age of he changes his mind and decides to purchase an annuity.

I have tried in this lecture to cover a few of the more important points in the relation of life insurance to medicine but there are many others that could not be discussed owing to lack of time.

The Reform of Medical Education.*

BY DR. J. TANDLER,

Professor at the Medical Faculty of Vienna University and Chief of the Social Welfare Department.

Complaints regarding the inadequacy of medical education and proposals for reform in this sphere were already heard before the war and have since become much more clamant.

In every civilised country, attempts have been made, by means of resolutions and of investigations carried out by professors or the authorities, or even by the students themselves, to formulate principles the application of which was calculated in the opinion of their supporters to remedy the various defects, whether recognised or not.

The general opinion has always been that university instruction called most urgently for reform, and that changes in the medical curriculum would bring relief. Thus, new regulations for studies and examinations have been issued from time to time, after long and wearisome discussion, but no appreciable progress has been achieved.

There can be no doubt that the present position as regards the training of medical practitioners has its share of responsibility in explaining the low material, moral and social level to which the profession has fallen, but it would be unfair to attribute the whole blame to their training.

The medical profession cannot be dissociated from its social and political environment, nor can doctors be isolated from other workers.

The reform of medical education cannot therefore be regarded from the strictly limited standpoint of university teaching; the whole question must first be analysed before we can decide what is to be done in the narrower field of medical education.

We must first of all be quite clear on one point—no single formula applicable to all countries can be found. Each nation lives its own

* **Extracted from Quarterly Bulletin, Health Association, League of Nations—Geneva.**

life, has its own art, its own culture and, like the individuals, makes its contribution to that common stock, and is in some sort influenced by it. We must none the less endeavour to set out principles of general application.

A first category of questions concerns the doctor's *conditions of life and means of livelihood* under present economic conditions, the second concerns *his professional education* in relation to the university in general and the medical faculty in particular, and the third *his training for university teaching.*

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In modern economic conditions, a doctor is a member of a liberal profession in appearance, and appearance only. He deals in the health of those who entrust their health to his care, this anomalous position being mainly due to economic causes.

The doctor is interested in the health of his patients and does, in fact, spend himself in their interests; but it is not by health that he lives but—just the contrary—by sickness. The mumber of his visits and prescriptions is not determined exclusively by the condition of the patient, but sometimes also by his own pecuniary interests. This struggle of conscience which he has to face day in and day out does not strengthen the moral consciousness, but tends rather to sap it. Consciously or unconsciously, a doctor comes to regard himself as nothing more or less than a wage-earner, and is no longer satisfied with the sure but modest income of those who administer the common property of mankind, though really a trustee of human health. He refuses to be placed on the same footing as the priest, the judge or the teacher.

This attitude of mind explains many of the criticisms directed against the medical profession. There is such a thing as the right to health, just as there is the duty to be healthy, both for the individual and for society. The right of the community to require health in the individual is legally acknowledged wherever there are laws dealing with epidemics, as it is the primordial right of the community to guard against infection through individuals, and the segregation of lepers thousands of years ago was simply an expression of that right. Human society, which requires the individual to be healthy, also gives him the

right to demand that his health be protected by it. Had this argument—based on the normal relationship between the individual and society—ever been followed to its logical conclusion and acted upon, the medical question would have been solved long ago.

It would never occur to anyone to think that a judge should in each particular case exact payment from an individual appealing to the courts. Justice, as a common good, is guaranteed by the independence of the judge, who is paid by society for his work and need not therefore take into consideration the pecuniary circumstances of the plaintiff. Elementary education is an uncontested right in all civilised communities, and no teacher at a Government school is paid for his work by his pupils. Priests, who are appointed by a religious body or by the State—that is to say, ultimately by society—are not paid by individuals, but act as the mandatories of society.

Similarly, a doctor should be the mandatory of society and be paid by it, so that be may administer health, as a judge administers the law. Deliberate compromise for economic reasons, on the pretext of belonging to a liberal profession, is what has given the medical profession its commercial charactar, and this conflict of interests it is that has led to the present material and moral plight of the medical profession.

Nevertheless, there are attempts at improvement here and there. The health offices set up for the use of the community are a beginning. The doctors employed in them no longer treat private patients, but serve the community. In progressive countries and cities, where the value of these health offices is realised to the full, the doctors attached to them are forbidden to engage in private practice and are paid like judges or teachers. The extension of medicine beyond the bounds of therapy to prophylaxis and preventive care has led to the creation of a new category of doctors—social welfare doctors. They, too, have been obliged to give up their private practice and receive a fixed salary for their work—at least, in those countries in which the importance of this category of doctors is duly appreciated. Here it is no longer a question of the observance and application of health regulations; men and women need not be ill before they can benefit from the doctor's care.

A further step has been taken in appointing health insurance doctors. We do not, of course, intend to go into the whole problem

of health insurance here, but there is one point to which reference must be made. Health insurance doctors no longer receive private fees, but treat the patients allocated to them within a certain area for a fixed salary. The weaknesses of the system may be attributed here, again, to the fact that it is in the nature of a compromise, since, at present, most of these doctors still have private practices, though there are notable exceptions. When the health insurance offices decide to reserve the services of their doctors exclusively for their members and forbid them to have private practices, this important category of doctors will cease to be business men and will assume the more dignified position of administrators independent of private fees.

A great many arguments have, of course, been advanced against such a system, especially by the doctors themselves. They consider that they have suffered injury, since their whole education has inculcated in them the idea that their profession is a means of making money. Much is said about bureaucratisation, with all its attendant evils. Teachers, judges and ministers of religion are not necessarily bureaucratised, for bureaucratisation, in the sense in which we understand the word, is not the effect of a system, but an expression of individual personality. There are bureaucrats in the liberal professions, just as there are independent men in official positions.

All medical intervention is individual action, but it should not be the subject of personal remuneration. Doctors must learn to look beyond private fees and aspire to the higher ideal of retribution for service to the community. They will have to adapt themselves to the rights of society and be more punctilious in carrying out their duties towards it. This is the social foundations on which the medical edifice of the future will have to be constructed. True, for this, doctors will need a training radically different from that which they mostly receive to-day, and this brings us to the question of the university education of doctors.

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Universities presuppose secondary schools, where the pupils are prepared, so that much of the university question is really a question of secondary education. We do not intend here to go into the controversy of the last few years on secondary schools. One may be in favour of the classical or of the modern side in

education, but one thing is certain—secondary schools are not merely intended to raise the educational level of our young people, but are, and must remain, a preparation for the university. As a medical professor of thirty-five years' standing, through whose hands many students coming from secondary schools have passed, I may be allowed to express a frank opinion. Instruction in the secondary schools (I can, of course, only speak for the old Austria and the Republic of Austria) has, during the last decade, become easier, but not better. Its selective value has greatly diminished. Adaptation to the times in which we live—so essential for everyone, and especially for the man of science (and every doctor must be that to some extent)—is often inadequate, if not entirely absent. Our secondary schools—especially those of a classical tendency—are still too deeply imbued with ideals borrowed from the Greek and Latin cultures ; contemplation of the past deprives our young people of a just appreciation of the present. The desire of so many university professors to select their own students—to inaugurate a sort of entrance examination—is perfectly comprehensible, though I personally doubt if the increase in the number of examinations, however necessary, will lead to really satisfactory results. University reform therefore implies secondary school reform which, for various reasons, must no longer be delayed.

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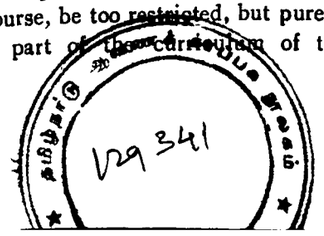
The reform of medical teaching and medical training generally depends on the attitude adopted towards the universities and their faculties. We need not discuss here the out-of-date system so often found in our universities, nor need we consider whether they can continue to exist in their present form. The question is rather: What are the faculties actually doing to train students for their future careers?

Two alternative have long been in conflict with one another. A faculty is either a professional school, or it is part of the university, and, as such must fulfil the requirements of a university. A professional school is there to impart the existing store of knowledge in the most adequate fashion and in the shortest possible time to those whose future profession requires special technical knowledge. The scientific horizon must not, of course, be too restricted, but pure research is not necessarily an integral part of the curriculum of the school. The



position is quite different in the university, though the latter has long ceased to be a *Universitas literarum.*

Research work is a vital necessity in any university. The university professor must be essentially a research worker, possessed of a critical sense resulting from the perfect mastery of the subject born of his own researches, and a pedagogue capable of imparting his learning to others. On the foundation of knowledge already acquired must be constructed the spiritual edifice of research work. This essential duality of function explains the inadequacy in one direction or another and, to a large extent, the conflict which every university professor and, indeed, every university has to face. Professional schools alone are not enough: nor are the faculties as we know them to-day. The defects of faculty instruction cannot be remedied by an increase in the number of subjects or examinations, but only by a change of system. This change must apply both to the subject-matter and to the form in which the instruction is given. Both these points have often been discussed.

As regards the form, some are partisans of the old form of academic instruction given in a lecture-hall by a professor, as constituting the only adequate method of instruction, while others maintain that the substitution for oral instruction of seminars and laboratory and hospital work will solve the problem of medical education. Many illustrations and arguments can be produced in support of either view.

In this connection, too much importance is perhaps attached to method and too little to the personality of the teacher; here, as in other walks of life, it is personality that chiefly counts. The academic professor is not a walking textbook and it is not his business to reproduce all his knowledge for the benefit of his students, but rather to stimulate the latter, by the style of his lectures and his method of propounding problems, to think for themselves. The fact that not all academic professors are capable of doing this is the fault, not of the system, but of the choice of professor.

The masterly exposition which permits of the survey, as from a height, of the whole field of learning must not disappear. That is how the professor communicates the results of his own experience and inculcates in his pupils a taste for research. This kind of teaching

must not be neglected in future if medical instruction is not to degenerate into medical "drill". For this reason, the entire replacement of other forms of instruction by seminar and practical work would certainly be an extreme and exaggerated measure. There is the danger of instruction degenerating into casuistical discussions, of the lack of a comprehensive or synthetic view of the subject. Already, in many clinics, the systematic course of pathology has been abandoned; the students are given innumerable object-lessons without being allowed to gain an insight into the diseases themselves or to become acquainted with the psychology of the sick, who, after all, cannot be ignored.

This does not mean to say that clinical teaching in the seminar or laboratory and practical work are superfluous. Medicine must be, not *learnt* but *lived* by the students, and, for this, hospital and laboratory work are indispensable. The student must not only receive impressions through sight, hearing and touch, but must live in the atmosphere surrounding every sick-bed, must learn to sympathise with human suffering before he can hope to succour it, and no professor in the world will ever be able to teach all this.

What is wanted is a large staff of assistants who, under the influence of their master, have themselves become teachers, and for this they must have time, and must be forbidden to have a private practice. When instruction and business conflict, business always wins. There are faculties where the assistants have flourishing private practices of their own and, in consequence, devote too little time and attention to their essential duties—namely, instruction.

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A much more difficult question is *what* should be taught, and this is, moreover, a question that cannot be solved by mere curricula or regulations. What must be realised is that doctors cannot and should not know all that their professors regard as indispensable. We have to admit that professors are often tempted to overestimate the importance of their own particular subjects and teach them as if every student was to become a specialist in that branch. Here, also, the master is known by his capacity to confine himself to what is indespensable. Many professors will never be cured of their partiality towards their own subjects. Perhaps the best method would be to reduce to a minimum the hours

of instruction in the several branches. Both professors and students would still be free to give or attend as many optional lectures as they desire. The rationalisation of compulsory lectures must therefore be one of the first reforms.

It is, however, not only the amount of instruction in the various compulsory branches that must be limited, the *number* of subjects should also be restricted. Compulsory subjects there must be, and their limitation is rendered the more difficult by the present tendency to make as many subjects as possible compulsory. Medicine has been badly hit by the modern mania for specialisation; specialised research work has made great progress and is, indeed, a condition of success. Specialisation in instruction has, however, done harm to the medical profession. This tendency is still increasing, and the number of branches which, according to their professors, students ought to study seems never-ending.

It is time that medicine was regarded from the point of view of the requirements of patients and not from that of existing and future Chairs. We must have the courage to jettison superfluous medical knowledge which seldom if ever proves useful in practice. I myself, as a professor of anatomy, am convinced that many Chairs of anatomy suffer from an excess of anatomical instruction. Descriptions of the smallest apophyses of the skeleton and the enumeration and description of the smallest muscles of the back and the finest arterial branches may be very interesting, but what good is it to doctors? After every examination—and, unfortunately, these details still form the subject of examinations—all this is dropped and foregotten to make room for fresh knowledge in the shape of minute histological details.

In the preface to my textbook, I said advisedly that students learn too much and know too little, and what I have said—in the light of my experience—of anatomy, which can only be taught with a view to practical application, may be said of most subjects. Everything taught must be in the interests of science and research, without being allowed degenerate into professional instruction or "drill". The solution lies not in reducing the amount of theoretical instruction, as advocates of "practical" instruction would claim, but rather in a different kind of theoretical instruction,

True, there is no branch of medicine in which a doctor cannot, upon occasion, act as a saviour. The only question is whether the amount of energy expended is not disproportionate to its practical value. Anyone who saves a fellow-being's eye-sight has done something worth doing, and any oculist has the right to be proud of it. Every doctor should therefore be taught ophthalmology, but is it necessary that every doctor should be an oculist? Ophthalmology is a branch in itself and forms the subject of a special examination, but what does even the best doctor know of it after a few years, unless he has specialised? In my opinion, it is sufficient if a doctor is capable of diagnosing in time conjunctivitis, lesion or abscess of the cornea, trachoma and glaucoma, so as to be able to protect his patients from the worst consequences of these affections. I do not think that one medical practitioner in a thousand would ever undertake an operation for glaucoma, though thousands have probably learned all the details of this operation only to forget them afterwards.

Quite as dangerous as many affections of the eye is *otitis media*. Students have to pass examinations in every detail of ophthalmology. but the same does not apply to diseases of the ear. These inconsistencies will be further multiplied in future. Each new method of medical diagnosis and treatment passes through the stages of research, doctrine, teaching and practice. First a lectureship is created, then an extraordinary Chair, and finally an ordinary Chair. So far, so good.

What we cannot approve is the consequent examination, in which the student is required to prove his knowledge of all these branches. For what is important is not the quantity of his knowledge, but the quality and the fact that he should select what is indispensable to any doctor, since no medical student can know everything, however many examinations he is required to pass. The psychotechnical institutes of the faculties of philosophy say that the human brain is only capable of absorbing new impressions for a very limited number of hours a day whereas the medical faculty, by overtaxing the students' brains, assumes just the reverse of this attitude. The subject-matter, therefore, and the number of branches must be restricted.

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Then, again, a student should not study medicine only, but should, also have an opportunity during this period of his life of developing

generally, of going in for sport and participating in the intellectual life of his time. The restriction of the intellectual horizon involved by concentrating on one particular branch of knowledge for years at a stretch is far more likely to make a doctor a bureaucrat than any of those rules and regulations to which doctors object on the ground that they lead to bureaucratisation.

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I would like to say a few words about examinations. The whole conception is wrong and is the direct outcome of the kind of instruction given. It is not likely that the professor will expatiate for years on the smallest details and then magnanimously refrain from demanding a knowledge of them at the examination. There are far too many examinations and far too many subjects for examination. Here, again, some restriction is called for. The application of the various reforms which have here been outlined rather than described is a first necessary condition for any thorough-going re-organisation. The training of a doctor must consist of two stages. In the first, he should be taught all things needful for his profession, both theoretical and practical. In the second stage, however, he must learn to be a doctor, and that he can only do by working on his own, under the direction and supervision of those who have already become proficient, persevering until he has mastered his profession. In other professions, this idea is by no means new. In early every country, a future lawyer, after having finished his law studies, must practise for some years as licentiate on probation, while a future judge must, after his studies, spend years in a court learning his duties. It is only in medicine that a student is considered to have terminated his studies and to be in a position to exercise his profession, directly he has passed the study period proper. His is left to decide for himself whether he is to embark on the treatment of patients. Such an attitude I would describe as sheer contempt for health, a gross lack of respect for our fellow-beings.

In some countries, the enormity of this offence has been realised, and it has been decided to introduce a so-called practical year, as if one could, in one year, learn to practise an art which has required six years of preparation. It may well be that the fine reputation enjoyed by Austrian doctors is partly due to the fact that, after they have taken their doctor's degree, they are required, practically without exception,

to serve for four years in hospitals as assistants and are already doctors of proved capacity before they go into practice.

However, not all men are equally conscientious ; what one does, another will leave undone, and on this depends the life and health of innumerable people. A three to four years' hospital period should therefore be compulsory. No one should be able to obtain the *venia practicindi* unless he can prove that he has really employed these years in acquiring a training, and this would mark the inception of quite a new system of medical education. I am convinced that four to four and a-half years of theoretical and practical training on the lines I suggest would be sufficient. After the examinations, there would be at least a three-year course of practical training in the hospitals, and it would only be at the end of this period that a doctor would be authorised to practise.

I will not go into details. The essential thing is to distinguish, in the education of the future doctor, between theoretical instruction in medicine and training with a view to his future profession. There must be no compromise here, and it is that tendency to compromise so characteristic of our time, that renders such a reform difficult, not to say improbable.

All the reforms suggested up to the present will, however, prove inadequate, unless—without prejudice to the therapeutic claims of the individual—the need is realised of familiarising the doctor with the social structure of the society in which he lives, and unless he is acquainted with the legal bases of social policy as a whole and has learned to adapt himself to them. A doctor who has been taught and trained on these lines, no longer haunted by the thought of his daily fees, will cease to be a mere wage-earner, and, as a trustee of human health, instead of following a trade, will take his place in a profession capable of bringing him satisfaction and enhancing his self-respect.

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Case Reports.

By Dr. A. P. Pai, M.B., B.S., House Surgeon,

Special Department, General Hospital, Madras.

The following two cases are reported as they are the first of their kind on record at the Venereal Department of the General Hospital. The first one in which encephalitis developed after two injections of bismuth salicylate administered for a case of soft sores. The second one was a case of purpura hæmorrhagica due to arsenical intolerance. In this there was bleeding from the nose and the mouth and probably also from the intestines mucosa. There were no purpuric eruptions on the skin and there was no joint lesion. Arsenical purpura is considered to be a fatal condition, but the case under report took quite a favourable turn with a ordinary treatment for any hæmorrhagic condition.

A Case of Bismuth Encephalitis.

Name : S. B. 28 yrs.

Admitted on 3-8-33.

Patient, a robust young man, a fireman by profession, was brought into the department unconscious with a history of having had two intramuscular injections outside for sores on penis. The last one was given on 22-7-33 (*i.e.*, 12 days back). He developed a temperature 3 days back and in the early hours of the morning he had a fit and became unconscious.

Information got from the practitioner who treated him was that the patient had two intramuscular injections of bismuth salicylate. After the development of unconsciousness the patient had one intravenous hexamine.

Condition on admission.—Two soft easily bleeding sores on the inner aspect of the prepuce. Groin glands on the left side palpable.

C. N. S.—Patient comatose. Tendency to conjugate deviation of head and eyes towards the right. Picking and pill rolling movements of the fingers. Pupils moderately dilated and not reacting to light.

Tendon jerks exaggerated. Plantar response, left extensor, right flexor. Passing urine in bed.

T. 102°F. P. 100. R. 30.

Circulatory system : Nil abnormal. B. P. 120/80.

Respiratory system : Respiration hurried. No dullness on percussion. Has a cough. Coarse rales heard over both the lungs, more on the left side than the right.

Treatment and progess.

3-8-33. Calcium Thiosulphate 10 c.c. intravenous

Adrenalin ½ c.c. every 4th hour.

Plenty of glucose by mouth

Soap and warm water enema.

10 A.M. Lumbar puncture was done. Cerebro-spinal fluid was clear and was under pressure. About 40 c.c. was drained. Specimens were sent for investigation.

2-30 P.M. L. P. repeated. Fluid was still under pressure but less than what it was previously. About 15 c.c. drained.

3 P.M. 10 ozs. of blood let out from a vein by closed method.

4-8-33. Calcium Thiosulphate and adrenalin injections continued. Bowels opened by an enema.

2 P.M. L. P. repeated. B. P. was taken before and after the L. P. Fluid was slightly under pressure. 15 c.c. drained.

B. P. before L. P. 120/70. after 100/65.

8-30 P.M. B. P. 95/45. L. P. was not repeated at B. P. was falling.

5-8-33. Patient much better. Fairly conscious. Answer questions fairly well. Still has a muttering delirium.

6-8-33. Patient conscious.

8-8-33. Temperature has come down to normal. Still has a bronchitis and slight pain over chest.

16-8-33. Patient was discharged cured.

Local antiseptic dressing for the soft sores was given. Sores were almost completely healed at the time of discharge.

Investigations.

Blood : Khan Doubtful. W. R. Negative.

C. S. F. W. R. Negative

Cell count—Normal

Albumin—86 m. gm. per cent.

Globulin—a trace.

Sugar—1666 per cent.

Chlorides—750 m. gm. per cent.

Gold Sol. Test—Negative curve.

Culture—sterile.

A case of Arsenical Purpura Haemorrhagica.

Name : S. 22 years.

First attended the department as an out-patient on 22-7-33 with a history of discharge 2 years ago and sore penis 2 months and rash 1½ months.

At the time of the first examination patient had no urethral discharge. There were two small healed scars on the coronal sulcus. General enlargement of glands present. Faded moist papules over the skin of the scrotum. Extensive, coalescing, dark, pigmented papular rash over the palms, some of which were scaly. Hyperkeratosis and pigmentation of the soles. A few pigmented patches over the palate.

Blood-Khan—Strongly positive. W. R.—Strongly positive. Had three weekly injections of Novarsenobillon and Bismuth. Total 0·95 gram of Novarsenobillon and 3 c.c. of Hypolid Bismuth.

Last injection given on 7-8-33.

9-8-33. Reporting with a history of bleeding per rectum on 8-8-33 and bleeding from the nose and mouth since this morning. Conjuctiva congested. Pulse and general condition fair. Was admitted into the wards.

Calcium Thiosulphate 10 c.c. intravenous.

Adrenalin ½ c.c. every 6th hour.

Pulse and respiration recorded hourly.

Epistaxis again in the evening. Calcium chloride given i. v.

Blood. R. B. C. 4,650,000

W. B. C. 8,125

Platelets 14,762

Diff. Count : Polymorphs 64 per cent.

Lymphocytes 24·6 per cent.

Monomucleans 8·6 per cent.

Eorinephits 2·8 per cent.

10-8-33. Bleeding from mouth and nose in the morning. Pulse rapid, volume and tension fair. Horse serum 20 c.c. i. v. 20 c.c. i. m. Calcium Thiosulphate and adrenalin continued. Bowels opened by a glycerine enema. Motions were tarry in colour.

Urine : Not bloodstained

No R. B. Cs.

No albumin.

Blood platelets 12,500.

Blood transfusion could not be done as no compatible blood was available.

Since 11-8-33 there was no more bleeding. There was slight sponginess of the gums and the patient was complaining of photophobia.

Platelet count was gradually increasing.

11-8-33. 20,000
13-8-33. 20,000
14-8-33. 20,000
16-8-33. 50,000

Patient was discharged from the wards on 24-8-33 at request. Is attending the out-patient since 13-9-33. He had no further attacks. No arsenical injections are given.

(I am indebted to Dr. R. V. Rajam, M.B. M.S., (Mad.), M.R.C.P. (E.), Veneral Specialist, General Hospital, for his valuable suggestions in getting up these case reports and for kindly permitting me to publish them.)

A Case of Bell's Palsy.

(*From Dr. P. Krishnaswami's Wards.*)

By S. R. Raja Ram, Final Year.

Name—Mr. S. *Age*—24 years.
Occupation—Signaller, S. I. Ry. *Residence*—Perambur.

Complaint—Weekness of the right side of face.

Duration—one week.

History of Present Illness.—A week back patient attended a dance in the open and thus exposed himself to chill. Next morning patient got up and found weakness of the right side of his face.

History of Previous Illness.—The patient has been uniformly healthy throughout. Denies specific or alcoholic history.

Family History.—No history of paralysis in any of the members of the family.

Physical Signs on admission.—Patient fairly well nourished; presents no signs of anæmia, teeth clean, pyrrhoea alveolaris not present,

signs of facial paralysis, no paralysis in any other part of the body. No tenderness in the region of the mastoid, no middle ear disease.

C. N. System.—Memory and intelligence good. Perception normal.

Paralysis of the 7th nerve. On the right side the following are noticed :

(*a*) Both upper and lower parts of the face shown complete facial paralysis.

(*b*) No wrinkles on the forehead on the right side.

(*c*) Inability to close the right eye.

(*d*) Naso labial fold absent, no retraction of the angle of the mouth.

(*e*) Cannot whistle, or articulate the labials.

(*f*) Accumulation of food on the right side of mouth. Platysma a on the right side.

(*g*) Loss of taste in the anterior two-thirds of the right side of tongue, right side normal in the posterior thirds and dorsum.

(*h*) Hyper acusis on the right side, normal on the left.

C. N. system otherwise normal.

Other systems—Nil abnormal.

Investigations :—

Urine.—Reaction Acid, Alb. *Nil*, Sp. Gr. 1015, Sug. Phosp, *Nil.*

Motion, No ova. Blood Film No Parasite. Blood pres. W. R., Negative. Reaction of Degn., Partial.

The positive findings in the case are :—

1. Paralysis of the whole face on the right side in upper and lower parts.

2. Loss of taste in the anterior two-thirds of the side of tongue.

3. Hyper acusis on the right side—paralysed side.

The possible sites of lesion are:—

(*i*) *Supra Nuclear.*—Ruled out, since in a supra nuclear lesion only the lower part of the face is paralysed with plegia on the same side, if the lesion is in the internal capsule or above the pons, and crossed hemiplegia if the lesion were in the pous.

(*ii*) *Nuclear.*—Points in favour are:—

1. Paralysis of the whole face.
2. R. D. present.
3. Atrophy of muscles of the face on the right side.

The point against it is the absence of involvement of sixth nerve nucleus, which is generally affected due to the 7th nerve winding round the 6th nerve nucleus in the pous.

(*iii*) Infra Nuclear Lesion or Bell's Palsy:

This may be further considered under the following heads:—

(*a*) Intra cranial, (*b*) Aqueductus Fallopii, (*c*) outside the stylo-mastoid foramen.

(*a*) *Intra cranial.* The 7th nerve energes from the brain between the olive and the resti from body, *i.e.*, in the lateral recess—in close company with nerves. Any lesion at the site will ordinarily involve other nerves also.

Between the Lateral Recess and the Internal Auditory Meatus, the 7th nerve has for its relation the 8th nerve which is commonly affected in a lesion at this level causing nerve deafness.

(*b*) *In the Aqueductus Fallopii.* In its short course in the peterous bone, the 7th nerve gives off the chorda tympani nerve one quarter inch above the stylo-mastoid foramen, and at a higher level the nerve to the stapedius is given off.

In the case in question there is not only the paralysis of the chorda tympani, but also paralysis of the nerve to the stapedius as is evidenced by the hyper-acusis on the affected side, due to the unbalanced action of the tensor tympani muscle. Hence the lesion is clearly above the level where the branch to the stapedius is given off, but is below the Genicu-

late ganglion, since a lesion of this ganglian would cause herpetic eruption in the concha of the ear and arcund the external auditory meatus. The simultaneous affection of taste and paralysis of the face show that it has not been an ascending inflammation from below.

Yet another point of interest in the case is that according to the patient's statement, he does not feel any diminished secretion of saliva on the affected side. The chorda tympani according to the famous experiment of the celebrated physiologist Claude Bernard contains three sets of fibres, vaso dilators, taste and secretary to sub-maxillary and sub-lingual salivary glands and it may be that in this particular case that only the taste fibres are affected.

Ætiology of Bell's Palsy.—According to James Collier—the facial nerve is the most commonly paralysed nerve of the body.

1. Age commonly occurs between 20—35 years. Rare in extreme of age. No partiality to either sex.
2. Gout and Rheumatism predi-pose to an attack.
3. Exposure to chill—commonly in a railway carriage with the face outside the window is the classical type, setting up neuritis and perinuritis of the nerve.
4. A sore throat spreading to the middle ear, or a middle ear disease *per se* causing caries of the temporal bone and spreading up to the aqueduct fallopii.
5. A spreading inflammation of the fibrous tissue forming the deed part of the Parotid sheath, which also is prolonged as a sheath, on to the facial nerve into the aqueduct. In such a case there is swelling and tenderness in the stylomastoid region. The swelling is sometimes so very considerable, that no less a neurologist than James Collier has wrongly diagnosed this for a growth in the stylomastoid region.
6. Basal meningitis—Syphilitic in origin, here one or more of the other cranial nerves are also involved.
7. Diphtheria and Alcohol are occasional causes.

Prognosis.—

Chiefly depends upon the etiological factor. In cases due to chill recovery is the rule. The period of recovery varies from a few weeks

to two years, depending on the extent and nature of reaction of degeneration.

A. No. R. D. at all—Prognosis—Good.

B. Partial R. D. in the Muscle—Prognosis—Fair.

C. Complete R. D. in the Muscle—Prognosis—Bad.

Treatment.—

Potassium Iodide : salicylates by mouth. Mercury inunction and warmth to the face and mastoid area. Electical massage started after a week.

The progress of the patient is noted to be very satisfactory and bids fair to a rapid recovery in as much as the orbicularis palpebrum, which is said to be the Ultimum Moriens of the facial muscles shows voluntary movements.

My thanks are due to Rao Bahadur Captain P. Krishnaswami for his valuable suggestions and his kind permission in allowing me to publish this case.

The Unlucky Thirteen.

BY ANONYMOUS.

Now and again one hears of misfortunes dogging thirteen members of a family or thirteen sitting at a dinner party. Of course the superstition is to be ascribed to what transpired to the thirteen who sat at the last supper on the night Jesus was betrayed. When such incidents are brought to our notice we just pooh-pooh the idea ; but what actually transpired to thirteen students of this College who once sat together at a jolly tea party at Basotto's will be read with interest.

There were thirteen of them, all second year students. One never succeeded in getting past anatomy and physiology and I believe, has opened a chemist's shop somewhere. One died of enteric fever. Another has unfortunately become insane. Yet another committed suicide. One of the surviving members got himself entangled in a disgraceful love affair. Of the rest none has so far succeeded in obtaining the M.B.B.S. degree, although some of them happen to be smart enough. Let us hope their misfortunes have ended.

Our Men and Things, Round the Hospitals in Madras.

By Arvy.

It is strange that people should have no respect for my grey hairs or even for the fact that I have passed more than half the biblical span of life. They ask me to gain more experience. Whatever be the nature of the misfortune that befalls me, I am glibly told by way of consolation that it is for my own good, since I can gain "experience". Therefore the matron of a big hospital where I was imprisoned as a patient to suffer the agonies of a wearisome disease consoled me by saying that in her opinion "every Doctor ought to gain experience by being a patient." I could not resist the temptation of replying that it was too long an experience even for a patient feller like me. Now I come back to be asked to gain experience even for "*reserve duty*." I was at first pickled within the confines of the "*rice-tub*." Then my abilities were emergently required to tackle the problem of feeding not those who were hungry but those who refused to eat. More urgent things happened. Without any previous warning an uncontrollable rush of cases occurred somewhere else. My qualifications and qualities physical, chemical, biochemical were requisitioned peremptorily to check, the mighty rush of mankind into the portals of the examination and dispensing rooms. But in the eyes of the powers that be my experiences were not enough. And it came to pass that loonies began to leak from both ends of the alimentary canal. Who else could be found but me to cork them efficiently and effectively? I am the only one who is sufficiently qualified academically to dispose of their extraordinary excretions.

Thus it was that I made a round of some of the hospitals in Madras. But unfortunately I was not able to complete the round as the vigilant editor insists on my recording my experiences even now. He is too precipitate and presistent! I cannot but submit to the higher will.

It was a stroke of genius that compared Royapuram to the benevolent autocracy of a Native state, the General to the conventional bureaucracy of British India, and the Mental to the land under martial law. Don't ask me the inconvenient question whether I agree with the

above comparison or not. Suffice it to say that comparisons are always odious however much of truth there might be in them.

I must confess that I did not like the idea of restricting my activities to the confines of Royapuram especially when I had returned from abroad with abundant enthusiasm which of course was duly frozen to death. I subsequently found that Royapuram is a potential field for silent work. There is a fund of clinical material which goes to waste for want of sufficient staff. But no one can doubt the efficiency of the existing staff.

If it is opined that Royapuram is under one man's rule, it is foolish to brush it aside as nonsense. No one can conscientiously deny the Superintendent the power which he has rightly acquired by his dominating personality and his versatile talents. He, with his full six feet of authority, the height, size and shape fully qualifying him for the London police force, his respectable paunch, his child-like chubbiness of the face suggestive of perennial youth, only to be constrasted with the unwelcome patch of alopecia over the vertex, the only sign in him of advancing age, the peculiar curvature of his thin lips characteristic of grim determination, his cow-boy like strides adding dignity to his majestic appearance, richly deserves to be the ruler of Royapuram. But he is as diplomatic as he is commanding. His peculiarity of hallowing everyone old and new as "old things," his assumption of a free and easy attitude towards friends as well as foes and his extraordinary ability to feel his way and plan before decisive action are qualities sufficiently potent to enable him to intervene in departmental politics effectively. He is the students' terror and at the same time their idol. He takes interest in teaching and successfully infuses the same amount of interest in other members of the staff as well.

I have nothing but praise for the system of teaching adopted in Royapuram, particularly on the surgical side. But personally I am not in favour of the unit system. I fear that it may curb the individuality of the juniors who ought to be given as much freedom in the method of teaching as well as in their work as the seniors. If the chief happens to be dominating as well as domineering his voice alone would prevail over other members who will be but meek followers of the omniscient prophet.

As far as I could find, the Royapuram students showed a real earnestness to learn. Being in their bloom of youth they are impulsive and impressionable. If they indulge occasionally in catcalls to force the authorities to grant a holiday on a rainy day, or in street brawls to show to the world that they are not dumb-driven cattle but young men with potential valour or give sufficiently loud vent to their musical propensities by engaging in rival duets between opposing blocks of the hostel, we are in no way justified in blaming them. They are merely justifiable ebullitions of young blood in vigorous circulation. Some of them are much better informed than even the M. B students. The defect is not in inefficient assimilation but in insufficient supply. I can unhesitatingly give my support to the Superintendent in his endeavours to strike at the meaningless and highly artificial difference in the standards between the L. M. P. and M. B.

I go back to my old *Alma Mater*, which has indeed " suffered a change unto something rich and strange." The old order changeth yielding place to new. I find new buildings have risen up like mushrooms as uncouth and irregular as the mushrooms themselves. The artistic grandeur of those ancient buildings has been lost in the monotonous plainness of the new ones. The new out-patients department is a huge waste of brick and mortar reminding one of Tagore's golden cage without the pigeon. We can understand the necessity of its huge proportions if there is sufficient staff to man it all.

I find some new faces as well. But many of the old ones continue to support the superstructure of the old and new buildings like the pillars of ancient temples. " Men may come and men may go but they go on for ever". They may be found occupying new roles but they are unshaken and mistakable in their attachment to the *Alma Mater* which, I am glad to say, gets their moral and material support.

The outstanding feature of the General Hospital is that from time immemorial it has been governed by numerous but everchanging rules and regulations, so much so that it has become almost traditional to add one or two rules or orders every day. The voluminous proportions which the order book has assumed bears eloquent testimony to the ever increasing orders and rules. It is a strange fact that it does not depend on the Superintendent at all. But there is nothing new regarding the Order book. Poor old thing, how can it refuse to grow when it is persistently nourished with variegated food-stuffs.

The R. M. O. is a conscientious individual but extremely diplomatic. He avoids inconvenient situations and successfully tides over them by asking every complaining person, be he the thoti or the assistant surgeon to ' put it in writing '. To err on the wrong side is always bad but to err on the right side is excusable and even justifiable. If he, therefore, asks for explanations in season and out of season, he is perfectly justified in doing so to wriggle himself out of embarrassing situations. So my friend in the O. P. need not unnecessarily get alarmed nor unduly insulted if a more or less constant explanatory epistolary intercourse is established between himself and his immediate chief.

The enormous increase in the official routine work of the hospital can be judged from the fact that the present Superintendent leaves the hospital invariably at such a late hour as six o'clock. His abilities as an enterprising surgeon are unquestionable. Nor can anyone deny his capacity to govern. He has the tenacity of purpose and at the same time the tact and diplomacy which are essentially needed for a controlling Officer. He is deliberate in his speech as well as in his actions. His ability to understand human nature in all its intricacies makes him supremely human.

I find now another change which is particularly striking. The numerical denominations of physicians and surgeons as M(1), M(2), M(3) and S(1), S(2), S(3) were perhaps suddenly felt to represent inequality of status. Hence the big bugs in " common conclave sat " and dispensed with these irksome numerals and began to call themselves by their names. It is uncharitable to suggest that it is a clever manoeuvre on their part to have a legalised advertisement. But it has resulted in giving more work to the poor assistant surgeons who instead of signing AM1 and AS1 have to sign as assistant to A. B. C. or X. Y. Z. No, No, you will be insulting the bosses and if you write like that, you must write the whole name with its prefixes and suffixes. My friend in the O. P. of course does not mind the additional burden, since his existing function itself is nothing if not clerical. I pity the poor chap who is tossed between two lions, the pestering public outside and the suspicious staff inside.

I refuse to discuss the present political situation of the hospital as I would be treading on dangerous ground with numerous pitfalls. Being a non-party, non-interfering, but sufficiently selfish man myself, I do

not propose to wound the feelings of anyone. I respect and recognise their tender corns and I would propose a radical operation so as to allow everyone to walk with ease and amicability. No one can deny the existence of parties. It would be highly impertinent on my part to argue with my elders about the advisability of parties in an institution like the General Hospital. The elders know better. Whether it concerns an individual, family or a nation, internecine disquiet always interferes with the efficient execution of responsible work.

The college is really changing in its external aspects, but is still conservative in its mental outlook. It is customary on the part of old foggies to ' scorn the base degrees by which they did ascend ' and to say that in their time things were different. But students are always students ; Johnstonians and Robert Bruces are always found among them. I pity the poor Roberts who are too fat to pass through the narrow chinks in the doors at the bottom where particularly the guards are unnecessarily jealous of the standards in size of the individuals whom they allow through.

And it came to pass that the choleric patients of another Hospital began to suffer from Cholera. By a curious dispensation of Providence, I was deputed to redeem them from their additional misfortune. I found the place under the rigorous discipline of martial law. The sternness of the disciplinary activities of the military governor is only equalled by the milk of human kindness which so abundantly flows from him. The mental and moral derelicts of human society find in him a benevolent father " whose heart aches and a drowsy numbness pains his sense as though of hemlock he had drunk ".

He is so concerned and worried about his patients that a perpetual expression of worry is stamped on his face. He has bombarded the authorities with exceedingly nice schemes for the improvement of his institution. Unfortunately old ideas like old folks die hard. The Mental Hospital is considered as the dumping ground for not only the demented but also the unfavoured in the profession. The Superintendent has some really hard things to say of his double duty of certifying the sanity of his patients as well as the moral efficiency of his subordinates. He wants to remove from the minds of the authorities as well as the other members of the profession that it is a departmental punishment to work in a mental institution. Unfortunately his is and

perhaps will be a cry in the wilderness, for members of the profession would dread to enter its portals unless the stigma of punishment is removed. He is perfectly justified in saying that it is hopelessly understaffed. A handful of doctors and nurses can do practically nothing to a thousand and odd petients. People refuse to recognise that the inmates of the Mental Hospital are as much patients as those of other hospitals. They in fact require more specialised attention than the ordinary patients. The adoption of any form of therapeutic innovation will be impossible when there is not sufficient staff to organise and execute the same.

The Super asked me whether I would stick on there even after my work as repairer of leaks was over and be a permanent inmate of the asylum. I was silent. Silence meant not consent. You see that to work amongst people of unbalanced mind you must either have a head set tight on your shoulders, or your screws must be sufficiently loose to qualify you to claim a mental affinity with those fallen brethren. Well, I'm neither. Being more sensitive than sensible I would run the risk of being transferred from the society of the staff to the society of the inmates of the asylum.

But I did like my work as repairer of leaks. Our cholera camp itself had a bacteriophagic effect on the patients. There was no need to adopt any therapeutic measures as the very sight of the camp effected an instantaneous cure. Patients who were supposed to be vomiting and purging in other sections of the hospital used to get dried up or ice-bound for days together after admission to our camp. They would not even oblige us with a specimen stool sometimes. I am wondering whether the credit should go to the place or to my lucky hand. I shall leave it is an open question for others to decide.

The Super was profuse in his thanks when I left the place. I was so emotionally upset, perhaps mentally also (the association being sufficiently long) that I dropped a tear. I was treated not as a junior who according to some ought to be kept in his position under the thumb of the senior but as a responsible colleague who knew as much as anyone else.

I go back again to my first love only to be spurned aside as a rejected lover. But I hold fast even to the sinking mast like the tempest-tossed mariner with fond hopes that spring eternal in the human breast expecting a " better-spring a less bitter fruit bring forth.'

Editorial Notes and Comments.

We wish our Readers A very Happy and Prosperous New Year.

* * *

Our present Surgeon-General, Colonel Sir Frank Connor, I.M.S., has very kindly consented to be the patron of the Medical College Association in place of General Sprawson.

* * *

The following changes occurred in the staff of the Medical College and Hospitals: Col. W. C. Paton, I. M. S., was transferred from Madras as Civil Surgeon, Delhi. Dr. A. Lakshmanaswamy Mudaliar, B.A., M.D., F.C.O.G., was appointed to act as Superintendent, Women and Children Hospital and Professor of Midwifery, Medical College. The local papers announce that Lt.- Col. C. M. Plumptre, I.M.S., will be posted in the place of Lt.- Col. Paton, I.M.S.

* * *

The energetic secretary of the South Indian Branch of the British Medical Association got up a series of lectures and demonstrations under the auspices of the Association and they were all well-attended. Last week, Dr. Bhaskara Menon read a paper on "Enlargement of Spleen in South India". He is of opinion that Gaucher's disease, after reviewing the records of General Hospital and Royapettah Hospital, is conspicuous by its absence. Colonel Wright, I.M.S., delivered a very interesting lecture demonstrated by lantern slides on "Recent advances in Ophthalmology". He dealt very impressively the subject of retinal detachment and the retionale of its treatment with a brief outline of the present operative procedure. The staff of the Guindy Institute gave a demonstration of some of the techniques of their department. Dr. Muthu, M.D., and Dr. Dhamodharm, D.Sc., gave a combined lecture on Bio-chemical and Sociological aspect of Medicine. The latter sketched in an interesting way the advances made in elucidating the properties of vitamins and their chemical formulae.

Dr. John Orr, M.D., F.R.C.P., Dean of the Medical School of the Royal Colleges of Surgeons and Physicians, Edinburgh, was on a short visit to India. A tea party was got up by Dr. Mannady Nair, the Secretary of the British Medical Association, South Indian Branch, at the Medical College grounds. Within the short time available 26 doctors who had taken post-graduate courses at Edinburgh were present on the occasion. In his reply Dr. Orr referred to a request made by some of the members to give recognition to certain qualifications from the Local University and the Licensing Board. He said that everything concerning medical examinations was exclusively regulated by the General Medical Council and as such he could not do much in that matter: but all things pertaining to internal re-adjustment in connection with the Medical School of the Royal Colleges will be very sympathetically considered. The latter will be borne out by every graduate who had the opportunity of meeting and interviewing Dr. Orr during their stay in Edinburgh.

* * *

This is the second year of the inception of the University Extension Board lectures, and the whole of January was devoted to different practical aspects of Surgery. Medicine lectures will be delivered during the coming month and details of the lectures will be found in the handbills published by the Registrar, University of Madras.

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One need not enter an apology for re-publishing the article delivered by Dr. Theodore Thompson regarding some salient points in connection with Life Insurance work. Many medical men forget that they are the employees of the companies for the time being, if they are not permanent officers of the company, and are serving the interests of the company. One other vital question is what will be the health of the proposer some years hence—the essential problem required to be solved by an experienced doctor handling the cases of the different companies. Good many

suggestions to guide a younger member of the profession will be found in his well-thoughtout lecture.

A pocket-guide dealing with Indian lives and other problems connected with them, as height, weight, expectancy, etc., written by Dr. J. J. Cursetji, M. D. J. P. of Bombay, will be found of immense use in this country. It is a fairly comprehensive book and in its third edition has grown out of its pocket size.

* * *

Various problems of Medical Education and organisation have been engaging the attention of the University authorities and experts of medical education the whole world over during the last decade. A change here and a change there are the only results that have been achieved. Nothing of a very radical character has been attempted to lighten the arduous course for the students, which year by year is getting more and more over-crowded with the result that even their personal hygiene hardly receives the legitimate attention. In this connection, a thought-provoking article from Dr. Tandler of the University of Vienna will be read with great interest by all who handle things medical. The fundamental principles of Medicine should be stressed during the collegiate career; the minor details can profitably be picked up during the period of post-graduate hospital training which should never be less than 3 years. Specializations in different branches have very many things to commend themselves, but one should not run away with the idea that the mind of the student should be crammed with all the latest and rarities, just as the philatelist in search of rare postage stamp. The curriculum of the University should be ruthlessly cut down still keeping an eye on the fundamentals and broad principles.

Unification of qualification confirming to international standards will have to be brought into being to get rid of the undesirable caste system that has crept into the profession.

The All-India Medical Council, we feel sure, will do their best to bring out a solution for this vexed problem of the day.

Facilities for research should be afforded under the direction of various professors in all the institutions. Younger men should be encouraged and fostered in the traditions of the masters who by merit, intelligence and perseverence have gained to the topmost rungs of the ladder, and whose experience would become lost if proper use could not be made. Juniors well-trained for a long period will have to take their due place when the seniors retire, and they should so prepare themselves in this long period of sojourn to handle the departments with efficiency. They should be handsomely remunerated and debarred from all private practice, all their time being devoted to research and study.

* * *

The University examinations have once again come and gone. We have, once more, the pleasant task of congratulating one of our lady students on topping the list at the Finals. Miss Mary Mammen has not only beaten the boys but has several medals and prizes to her credit, we also congratulate Mr. Kesava Nair the runner up who has also bagged some of the coveted prizes. We feel that our boys must make one more effort to retrieve their good name; although chivalry has its place in our social life, the spirit of competition makes for better scholarship. Emulation and not envy is what we recommend. To those who had the misfortune to fail, we offer our sympathy.

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The annual sports of the College is to be held on Thursday the 22nd February. Col. Sir Frank Connor, D. S. O., I.M. S. will preside and Lady Connor has kindly consented to give away the prizes. It is here that we should like to see more of our fair companions competing. We remember the coaxing that had to go on last year to induce even four of them to take part in the ladies race. Let us have more competitors among them for the other events including the Tug of war!

Geography of Madras Medical College.

By H. Sumitra Rao, Final Year.

Anybody who has made a journey to Persepolis will, we are told, find the epitaph written by Xerxes, the Persian conqueror—"I am Xerxes, the Great King—King of Kings, King of the many-tongued countries, King of this Great Universe"—a noble claim and a noble monument to celebrate it. Even so, we believe the Madras Medical College proudly lifts its head and proclaims to be 'The College of colleges, the Great College, College of the many-tongued people, the College of Madras—standing, as it is, on the banks of the River *Cooum*. The River *Cooum* is not a sacred river like the Ganges, neither particularly as big as those others, nor particularly fragrant,—but it is a perennial River of *clear* waters, with many meanderings, never dry even in the driest of summer and sometimes swelling to an enormous extent especially in the rainy seasons carrying with it rich manure and exhaling aromatic odours. We honestly believe, the River materially adds to the dignity of our institution to be placed on its banks in the same way as it adds to the dignity of London to be situated on the Thames, Calcutta on the Hooghly and Benares on the Ganges. If not there is no inviting force for the authorities to pitch their college on the banks of such a *sacred* River.

Three Big Departments of the College—the Triumvirate of the oligarchy, Physiology, Bacteriology and Biochemistry—stand on its banks: the Olympian heights being exclusively reserved for Pluto, 'the King of the Dead'. It is indeed curious to note that matters have become topsy-turvy, in that Pluto reigns supreme in the celestial regions, while Mythology has assigned the subterranean regions as the 'Abode for the Dead'. 'Bacteriology' occupies a snug corner, on the extreme end of the verandah, singing to itself.

'Oh! Solitude, where are the charms
That sages have seen in thy face',

and reign gloriously musing

'I am monarch of all I survey,
My right there is none to dispute'
From my Room, all round the Laboratory
I am Lord of the student and the servant.'

But, sometimes he gets into a frenzy and frantically rushes out of his stronghold, spreading his octopus antennæ and encroaching upon the territory of Physiology with a host of microscopes, slides and coloured bottles.

A belt of latrines and urinals connect the Provinces of the Triumvirate with the Department of Health and Hygiene. These latrines and urinals are intended for public benefit and suggest to the world at large a sense of diffuse humanitarian philanthropy. The Hygiene Department is placed amidst the very *hygienic* surroundings, with a belt of latrines posteriorly, the River *Cooum* laterally, a cow-shed anteriorly and an asthmatic Gas room medially—measures particularly calculated for the Hygiene people to sniff 'Hygienic' air and study management of cattle.

Close by is Ramaswamy Iyer's Coffee Hotel, where the student-population repairs after the labours of the desk to invigorate its strained nerves with coffee, ice-creams and lemon-crushes. It is founded after the name of its illustrious founder 'MacGrath' of historic interest and managed by its proprietor Ramaswamy Iyer—a miniature Falstaff a portly figure, which some irreverent youths call a 'barrel', a fair round belly and a ready wit. To immortalise to posterity its founder 'MacGrath' of historic interest, Ramaswamy Iyer has hung up in his tiffin-room a well-sized portrait of its patron—a portrait which still hangs there for you to witness if I lie.

Needless for me to say that the Hotel is packed with rickety chairs and tables of diverse description, groaning under the weight of tiffin-carriers and cart loads of dust and dirt, the crevices of which forming a good nidus for bugs and cob-webs. The hall itself is a *spacious* one serving as a favourite haunt for crows by day and bats by night. In a corner stands the 'tap' oozing water, with an offensive 'sink' underneath—a veritable culture-medium for all bacteria.

Nearby is the General Hospital, that colossal structure, where humanity, actually suffers, recovers or dies. Needless for me to point

out that charming young girls and smart young boys skip about, day in and day out with stethoscopes in their hands, through the Hospital corridors.

The journey from the College to the Hospital is a matter of serious consideration, being reminiscent of John Bunyan's Pilgrims Progress. The way is beset with innumerable bottomless pits and bogs, hedges and fences of break-neck character, so that a stray visitor is forewarned against the indiscriminate use of the paths. Of course the 'short-cut' is through the Ladies' Common room, but we don't propose to trespass the 'via sacra' of the fair sex. Prizes are offered for obstacle races, but we regret to note that we are not offered any for our obstacle pilgrimage everyday from the College to the Hospital.

Adorning the 'front view' of the Madras Medical College is a massive structure with interminable and innumerable alleys, designated as the 'Pathology Institute.' We are told that sometime in the future there will be a regular exodus of Departments, with bag and baggage, to this new Institute and we earnestly hope that the various Departments will not get 'pathological' under its influence. We are informed that the Biology Department is also fighting for a decent place in the general scramble: and hats off for its valiant endeavours, which illustrates the principle of 'The survival of the fittest.' We wish the Biology people all success in their enterprises.

Thus far are a few of our reflections and, while thanking our readers for their kind attitude towards its author, we close our reveries, in the fond anticipation that its grateful author will try to meet the kind readers sometime later in the dim future with another article of another kind!—Meanwhlle 'Au revoir'!!—

The Pest of One's Life.

By "Victim."

I often wonder why the authorities of our College are so reluctant about getting rid of the mosquitoes which are a perpetual pest and nuisance to one and all—the professors, attenders, and last of all and not the least the poor students to whom partiality to the highest degree is meted out by the said mosquitoes—the sleeping lion was no more worried by the rat than we poor victims by these detestable creatures.

Many a young enthusiast enters the class with a full determination to jolt down every word "that falleth like a pearl" from our professor's mouth, but alas! he returns disappointed, with a knowledge of *PH*° less than when he entered—I'll explain why?

When the lecture starts, Mr. Ramadu, sits with his head between his hands, his pencil sticking over his ears, and all attentive, his eyes beaming, both his ears wide open, and his mouth half open (afraid that mosquitoes might get into it.

Hardly does he take down two lines, his body automatically inclines to one side, his left hand shoots down to save his leg, then the right hand takes its turn and does it with more vigour. "Devil take these mosquitoes," he shouts turning to his neighbour in the hope of making up the lost sentences, but he soon realises that his friend is sailing in the same boat as himself.

Resigning to his fate with utter dismay, and no anticipation of further hope, he diverts his mind to the new interest of crushing the mosquitoes and but in vain! his opponents are not so easily to be subdued; he tries his last weapon, thus utilising his pencil for the snatching purpose; getting a brain wave of Physics, he rubs his legs simultaneously together—and eventually his whole body is brought into motion.

So absorved is he in his work (principle one thing at a time and that done well) that "Time's up", he rises only to find the lecturer walking out of class.

With an approval of thanks and blessing in God's name, he uncivilly singly jumps out through the window into the more quiet world where he could do full justice to his itching parts.

This unbearable torment is none the less in the labs! Is it any wonder that we weigh things wrongly resulting in "very bad values (as our demonstrators will say) with a difference of 25 per cent?, or can we be blamed for breaking test-tubes or upsetting buckets! Surely not! "Oh Portia come to judgment" we cry.

It's a mighty problem to solve I understand, for they are beyond redemption, but if I'm not presumptuous, may I give a hint—It's the fashion of our times to end one's life with cyanides, can no one find any such cyanide to kill these mosquitoes? Perhaps a better solution can be found in this—the Government are trying to introduce Birth control in Madras Colleges and Schools. We sincerely hope they will try it on mosquitoes first: this is for human necessity; and we demand it.

University Debate.

BY L'ECOLIER.

1. The hall is packed, the gallery full,
   And everyone begins, to pur and pull,
   The place is rent with shrieks and yells
   What would happen, who could tell?

2. As each male one takes his place,
   Reminds us all of Guindy Race,
   As each fair sex, in she trots,
   Opinions pass freely—"Oh she's a rot."

3. The thin ones squeeze, the fat men curse,
   "Oh d...you" they shout, holding on to their purse,
   "It's my belly you fool," roars a huge mass,
   Dreading another Black hole of Madras."

4. Whispers a mimic, "look at president's moustache,
   "Just a c.m. long, to prevent hair rash.
   "Was n't rather the barber's mistake.
   "Or just?—for his modern wife's sake?

5. The president amidst cheers, unstably he stands,
   To address the guests of European sands,
   With quivering lips, he tries to frame words,
   But alas, his voice is not far off heard.

6. "Louder, louder", yell the angry 'hall,'
   Punctuating their anger with paper ball,
   "Send him to heaven," suggests a criminal brain
   "As his voice subjected to musical strain."

7. Mr. Jack Jones of Wales, then begins his debate,
   And rather does it—at a very slow rate,
   Advocates he—"the old things best,"
   Proving it thus—"they stood all test".

8. Kumbakonam next proceeds to the chair,
Adjusting his cap, resting on his tuft of hair,
With high eloquence, opposes, the things of old!
Dignantly the aged hold thin hands right up bold.

9. Slow and sure, sedate and stern,
Comes Pachiappa to take his turn,
Opposing the moder-r-r-n, emphasising the 'r'!
of Henry Ford Car.
The dis-a agreeable noise.

10. Forgetting not—the two foreign men,
Who are as humourous as Sir Gupta Sen,
Basing their jokes, on Jack Jone's views,
Quite as stale as—plum pudding stew.

11. The question is then put to vote,
With monotonous murmurings from old men's throats,
With few hands raised, the vote is however lost,
And hands forced down again, at a terrible cost.

12. The meeting is dissolved with half a dozen words,
From Reverend old Loyala who is refused to be heard,
Fingers go up to silence the crowd,
It's easier to waken—a man in a shroud.

13. Out walk the ladies all in a row,
Lacking a leader—such as John Barrymore,
In get "Marys" into the bus they possess,
Old medicoes left standing—for a lift—I guess (Excuse.)

Bacteria.

In view of the prevailing interest in bacteriological research, your readers may find this article of some use.

On a hot sulky day, I was very busy in the laboratory when in rushed my friend and colleague 'Professor Kock' of the Munro University, carrying a little box in his hands. He was very excited, and placing the box before me said "There, there is something to interest you, I have no time to chat," saying which he departed as hurriedly as he had come in. My curiosity was thoroughly roused I opened the box and collapsed with joy when I found it contained a series of slides of unknown Bacteria. Immediately I set to work. Below I give the results of my observation on these rare and elusive bacteria.

The first I named Bacillus Principalis a very important bacillus. It was of a pinkish white colour, and was 5 ft. 9 inches long. Two blue nucleii were found at its cephalic end. Careful examination revealed a few brown cilia fringing the upper margin of its buccal cavity. The bacillus seemed most happy when placed in chemical media especially CH Cl_3 and H_2S. I tried some of its reactions and found they were remarkable—on the chemical analytic staff it produced efficient work by reacting kindly. Its action on the microbe studentia was a stunning action—an action which made the poor microbe studentia dazed, rooted to the spot, and spontaneously produced a paralysis of its lingual nerve. The bacillus was often the cause of the absence of that pleasant institution known as a "RAIN HOLIDAY". It also produced such morbid conditions as work for the microbe studentia, from 7 a.m. to 5 p.m., and frequent enforcement of that abominable custom known as "SESSIONAL EXAMINATIONS." This bacillus had a commanding personality and won co-operation and respect from all and radiated Goodwill and cheer from all its flagellae.

I changed the slide wondering what the new bacillus was going to be. I looked and was amply rewarded for there came into view an amazing bacillus. It was balancing a surgeon's knife and an artery forceps, and was deep in thought. "What are you thinking about?" I asked it. "The best position in which to remove a pituitary tumour" it replied. "Who may you be?" I asked.

" Bacillus colonelae Superintendicus," was the reply.

Amazed I watched it carry on an operation with great success and skill, and to all outward appearance it did not seem one bit conscious of its cleverness. It looked so quiet and gentle. However the other bacilli and microbes seemed to know this bacillus well and were all bowing and giving due respects to it. I heard it lecture on " Fractures of the skull " most marvellous it was : it thrills me still.

The next slide showed a rare and interesting bacillus. This was a straight bacillus 5 ft. 9 inches long. Its cutis was of a brownish white colour. When I started my research on this bacillus it showed a few sparse cilia on the upper border of its buccal cavity. Now it is characterised by the absence of this cilia—the emulsion in which it was steeped must have caused the shedding of the cilia. It flourished well in a doctoria medium. It possessed a rare sense of humour, which only a select few could discern. Occasionally an illuminating and charming smile lit up its face. However on the poor microbe she-male studentia reading a case sheet, it invariably produced lacrimal secretion, red vision and stars ! On a certain day of the week the vocal cords of this bacillus would not work. I tried injecting soda bicarb, on the days (5 grains intravenously). The result was marvellous. The vocal cords started working faster and louder, on these days than on the other days of the week. This extraordinary bacillus revealed on careful examination nucleii on all its phalanges, so that its diagnosis was always correct. This bacillus was able to get a pulsation even in the coronary arteries. This bacillus was in great demand winning admiration and affection from all. It produced a toxin called ' THUMBO TOXIN '. This toxin when inoculated into the microbe studentia in their class room, produced violent and hectic reactions of a hilarious nature.

The next bacillus made me jump with joy when I saw it pink and white wriggling under the microscope. Would you believe it, this mass of pinkish bacillus quoted chunks from " alice in wonder land ". I immediately named it the " Mad Hatter ", but again to my surprise it started quoting, this time from Shakespeare, Shelly and Keats. " What shall I name you ? " said I you are too sublime to be the " Mad Hatter ", " " My name " said this extraordinarily clever bacillus " My name is Andersonia and I hail from Caledonia."

The Andersonian bacillus showed a remarkable skill in weilding the surgeon's knife—bones broken, bones pulverised were all made whole in a trice. Tumours of the tummy, tumours of the brain all disappeared by the reaction of this bacillus. This bacillus was surrounded by an aura of that plasma known as Good Humour, and was found to be very popular among the microbe studentia who usually had a scrumptious time when brought into contact with this bacillus, especially the she male of the species who adored the Andersonian bacillus. I give below a rhapsody sung by one of the microbes about this bacillus :—

There came a bacillus from Caledonia

Who always are Mousers of Belladonnia.

When asked, " dont they tear ? "

He replied " Here and there,

But they keep a beautiful shape so I do'nt bemoan (*a*) ! "

I looked into the next slide. What was this rare bacilli. I had so fortunately come upon—a bacillus not more than three feet long. The dome of its cephalic end was devoid of its usual cilia. An aura of friendliness seemed to surround this bacillus, even the timidest of she-male studentia approached it without fear. Seeing me look, the bacillus shouted. " Skin pencil ! skin pencil please, and where is your ophthalmoscope ! " I looked interrogatively at it " what, do'nt you know me " it said " I am the Pace-setter of the heart." I specialise in hearts " " Ah ! Ah ! " said I that accounts for it ! " as I was observing it I heard it call for the attendance register of the microbe studentia " mark all the she-male studentia absent " it said, and I gasped in wonder for I could see these poor microbes toiling hard in the out-patients.

This bacillus was accompanied by another bacillus " This " said the bacillus, this is my assistant Bacillus and the bacillus you see at the far end is another who assists me in setting hearts right." I looked and saw the micrococcus Desmoney, who to my great surprise had a tongue which was one hundred times as long as its body ! I watched the bacillus as it made its way through the multitude of microbe studentia its tongue popping in and out of its buccal cavity incessantly, wonderful ! " Wonderful ! " said I and took up the next slide. I took some time in observing this bacillus, because it was a very

interesting one. I saw a characteristically short bacillus not more than 2 ft. long. Its shortness was gretatly emphasised by an assistant bacillus about 10 ft. long, which was closely following it.

This bacillus seemed a favourite with all the microbe studentia both male and she-male who looked upon it as a demi-God. It had an aura of protectiveness under which the microbes studentia took shelter.

This bacillus showed an interest not only in the academic studies of the microbe studentia, but also in their atheletic activities. I overheard portions of a conversation between this bacillus and assistant " Vibrio Chettio."

" Have the she-male studentia consented to the three-legged race, and the hundred yards dash " it asked " Oh God ! " said Vibrio Chettio " they will never do it, they only run when they want a bus or are chased by a cow, sir," and feeling it had said something funny it immediately started wagging its caudal end. When I placed the next slide under the microscobe, my heart nearly missed a beat. What extraordinary bacillus was this carrying an attache case whenever it went out. It was a shy, young bacillus with two beautiful blue nucleii at its cephalic end. One could see at a glance that this bacillus was a genius: all the microbe studentia seemed very fond of this bacillus. They flocked from far and near to hear its clinics, which always contained practical and useful points.

This bacillus was characterestically antagonistic to noise of any kind. This sensitiveness was shown by a facial hyperaemia, whenever the slightest noise was heard. Automatically I took up the next slide what teddy bearish looking bacillus was this. It had two twinkling green nucleii at its cephalic end. I could not take my eyes off them. Truly this bacillus could be called a 'green eyed god'. It looked a jolly bacillus, full of fun. It was always in boisterous spirits. It was very fond of the studentia, especially the she-male studentia, whom it bullied and teased to its heart's content as I was watching it, I saw a she-male studentia approach it " what is the dose of thymol " asked the bacillus.

90-180 grains " answered the studentia " " Madam " it said " Madam, do you hail from the veterinary hospital. You seem to be in

the habit of treating horses." The she-male studentia collapsed on hearing this, and disappeared into thin air.

The bacillus seemed worried over some election, and judging by the number of other bacilli who promised this bacillus their vote this seemed a causeless anxiety.

I took up the next slide and got a bacillus which looked rather cross and seemed to say " now please don't dare come near me." This bacillus when made to react with the microbe studentia the final year, heavy acid reactions took place, but on the microbe studentia the third year only sugar reactions resulted. It looked a very cynical bacillus but when I observed it more closely I found all this was external, and that in its inner most heart the bacillus was made up of what is commonly known as the milk of human kindness.

Oh dear ! it is already 5-50, and I am due in another 10 minutes to lecture at Leacocks' Gardens so I stop.

SPOT THE PROFESSORS.

——

In Lighter Vein

While the diagnosis of the patient, who had eaten rather generously, was proceeding, the sickman said: "Doctor, do you think the trouble is in the appendix?"

"Oh, no," said the doctor, "The trouble is with your table of contents."

———

"Now," said the bridegroom to the bride, when they returned from their honey moon trip, "Let us have a clear understanding before we settle down to married life. Are you the president or the vice-president in this household?"

"I want to be neither president nor vice-president," she answered, "I will be content with a minor position."

"What position is that, dear?"

"Treasurer."

———

When a man says his word is as good as his bond, get the bond.

———

If cheerfulness counts, the bride's father is generally the best man at the wedding.

———

The man today who hides behind a woman's skirt is no coward; he is a magician.

———

The pessimist wears a belt as well as braces; the optimist wears neither.

———

Epics describe the brave deeds of men called epicures.

———

Pupil to Professor of Mathematics: Was Euclid a man whose word could be trusted, Sir?

Professor: I have never heard it suggested that he was other than a man of entire integrity.

Pupil: Then why can't we take all these propositions as proved, Sir?

———

The Mayor (reading from the town's health report): The death rate was twelve point nine.

Councillor: What do you mean?

Mayor (embarrassed): It means that twelve died and nine were on the point of death.

———

A man, charged with an assault was asked whether he was guilty, "How can I tell, your honour, till I have heard the evidence,' he said.

———

"I shall be at home next Sunday night," said a lady to her beau, who was wavering in his attachment. "So shall, I," was his reply.

———

When deaf-and-dumb people marry, they may be said to be unspeakably happy.

———

Matchless Misery.—Having a Cigarette and nothing to light it with.

———

Teacher (during History lesson): What are the Races that have dominated England since the invasion of the Romans?

Pupil: The Derby and the Grand National.

———

She: I can't stand kissing.

He (suavely): Shall we sit down?

———

Hartly Coleridge once being asked which of Wordsworth's productions he considered the prettiest, promptly replied "His daughter Dora."

" Tho' lost to sight, to memory dear," said the maiden to her lover, when his face was buried in beard and whiskers.

———

A man addressed a passionate love letter to a lady, adding

Postscript : " Please send a speedy reply ; somebody else in my eye."

———

A little girl hearing that her mother was going into half-mourning, wished to know if any of her relatives were half-dead.

———

" You want a flogging," said the father. " I know it, dad, but I will try to get along without it " said the son.

———

" Why are ships always spoken of in the feminine ? "

" Because they always need men to manage them."

———

A man who had been fined several times for drunkenness, coolly proposed to the magistrate to take him by the year at a reduced rate.

———

Infantile kleptomania : We saw a little fellow the other day, only two years old, who had his father's eyes and his mother's nose and chin.

———

She : " And what would you be now if it weren't for my money ? "

He : A bachelor."

———

Geo and Kuri were disputing over the nationality of Das, and Geo said " I say that if he was born in Madras, he is a Madrassi." " Dash it," said Kuri, " if a cat should have kittens in the oven, would you call them biscuits ? "

No Secrets from Him.

" Did you hear Erica is marrying her X-ray specialist ? "

" Well, she's lucky. Nobody else could ever see anything in her."—*Washington Labor.*

———

Rash Remark.

" Should a doctor tell ? " inquires a head-line once again. If the trouble happens to be measles, it will soon be spotted anyhow.—*Humorist* (*London*).

———

Professional Knowledge.

Garage Owner's Assistant :—" Hey, Boss ! Your doctor's out here with a flat tire and he wants to know what it's going to cost him."

Garage Owner :—" Diagnose the case as flatulency of the perimeter and charge him $10·00.

———

Scratchin'.

" I hear, Uncle Wash," said Doctor Brown, " that all your folks have the itch."

" Yas suh, Doctah," replied the old darky, " De good Lawd has done 'flicted we-all dat way."

" And are you doing anything for it, Uncle ? "

" Oh, yas suh, Doctah, yas suh."

" What are you doing ? "

" Why, suh, Doctah, we-all is scratchin', suh."

———

The medical student said to the well-known doctor, " And is it true, sir, that fish stimulates the brain ? "

" Probably," replied the doctor. " But one thing is certain. Going fishing stimulates the imagination."

University of Madras and Andhra University

Pre-Registration Examination in Medicine, 1933

INORGANIC CHEMISTRY

FRIDAY, 15TH DECEMBER. 10 A.M. to 1 P.M.

Candidates must use separate books for PARTS I *and* II.

PART I

1. Explain how the molecular weight of a substance may be determined from observations of the depression of the freezing-point. If one gram of a substance is dissolved in 15 grams of water, the freezing-point is lowered 0·37° C. What is the molecular weight of the dissolved substance?

[The constant for water is 19.] [17]

2. Mention the chief theories which have been advanced to explain catalysis, and describe experiments in support of one of them. [17]

3. Why is a solution of sodium carbonate alkaline? Why must phenolphthalein not be used as an indicator for titrations with sodium carbonate? [16]

PART II

1. What is meant by 'association' as applied to liquids? How can such association be detected? [14]

2. Write short notes on :—

(*a*) Protective colloids.

(*b*) Dialysis.

(*c*) Adsorption. [18]

3. A solution of sodium chloride containing 8·78 grams per litre freezes at −0·539° C. To what extent is it ionized? [18]

Pre-Registration Examination in Medicine, 1933

PHYSICS

FRIDAY, 15TH DECEMBER. 2 P.M. to 5 P.M.

Candidates must use separate books for PART I *and* II.

PART I

1. What is meant by the 'surface tension' of a liquid? Explain the ascent of water in a clean glass capillary tube. How will the capillary rise be affected by a thin coating of paraffin inside the capillary tube? Under what conditions will the surface tension of a liquid vanish? [16]

2. Describe, in detail, how you would measure the velocity of sound in a gas, say carbon dioxide.

Give the relation between this velocity and the other physical constants of the gas. [16]

3. An X-ray bulb is to be worked by an induction coil which, in turn, is to be fed from the 220 volts D. C. mains. Give a sketch of the arrangement you will adopt. Explain how you would demonstrate the fact that X-rays penetrate matter to a greater or less extent. [18]

PART II

1. Explain (*a*) the physical significance of the product pressure X volume of a given mass of gas, (*b*) the use of a volume-pressure diagram for calculating the work done in a Cannot cycle of thermal operations. [18]

2. Give experimental details for and explain the theory underlying the determination of

(*a*) the radius of curvature of a spherical surface by means of a spherometer;

(*b*) the angle of a prism correct to the nearest minute by means of a spectrometer. [16]

3. Write a note on electro magnetic induction, and explain the principle and action of a Graham-Bell telephone. [16]

Pre-Registration Examination in Medicine, 1933

GENERAL BIOLOGY

SATURDAY, 16TH DECEMBER. 10 A.M. to 1 P.M.

Candidates must use separate books for PARTS I *and* II

PART I

1. Name the nematodes which infest the human body and give their general characteristics.

Trace the 'hook-worm' infection from man to man. [16]

2. Describe the alimentary canal of the rabbit, the earthworm, the leech and Hydra. Give an account of the process of digestion in each of these. [16]

3. Write short notes on:—placenta, assimilation, parthenogenesis, mutation, cœlom, cysticercus. [18]

PART II

1. Give an account of the structure and development of roots in Ferns, and mention important differences as compared with the roots of Angiosperms. [18]

2. What is growth? What are the conditions necessary for growth? Give an account of the properties exhibited by 'growing points'. [16]

3. Describe the various methods of dispersal of seeds and fruits, giving examples to illustrate your answer. [16]

First M.B. and B.S. Degree Examination, 1933

ORGANIC CHEMISTRY

FRIDAY, 1ST DECEMBER. 10 A.M. to 1 P.M.

Candidates must use separate books for PARTS I *and* II.

PART I

1. A monobasic acid was found to have the formula $C_8H_6O_4$. On treatment with acetyl chloride 1·024 gram of the sodium salt yielded 1·855 gram of an acetyl derivative. What is the structural formula of the acid? [10]

2. How can (*a*) sulphur, and (*b*) iodine, be estimated in an organic compound? [8]

3. What is meant by the term 'hydrolysis'? Give examples and experimental details for one hydrolysis you have yourself performed. [7]

PART II

1. Describe how you would prepare a specimen of glacial acetic acid from vinegar. Show how you can convert it into the acid chloride, anhydride, and amide. [9]

2. Write notes on (*a*) biuret, (*b*) ethylene linkage, (*c*) tautomerism. [9]

3. By what physical and chemical test could you distinguish between (*a*) methylamine hydrochloride and ammonium chloride, (*b*) ethyl nitrite and nitro-ethane, (*c*) propylamine and dipropylamine? [8]

First M.B. and B.S. Degree Examination, 1933

ANATOMY, INCLUDING ELEMENTS OF HUMAN EMBRYOLOGY

FRIDAY, 1ST DECEMBER. 2 P.M. to 5 P.M.

Candidates should use separate books for PARTS I *and* II.

PART I

1. Give a detailed account of the Hypophysis Cerebri (pituitary body). What do you know about its development? [17]

2. Describe, under the following heads, the urinary bladder in the adult male, when the organ is empty and contracted:—(*a*) position, (*b*) shape, (*c*) relations, and (*d*) mucous membrane.

What are the arteries and nerves which supply the urinary bladder? [17]

3. Describe the cuboid bone. [16]

PART II

1. Describe in detail the external acoustic meatus. [16]

2. Describe the biliary apparatus. [17]

3. Describe the position, relations, lymphatic drainage, and development of the mammary gland. [17]

First M.B. and B.S. Degree Examination, 1933

PHYSIOLOGY INCLUDING BIO-CHEMISTRY

SATURDAY, 2ND DECEMBER. 10 A.M. to 1 P.M.

Candidates should use separate books for PARTS I *and* II.

PART I

1. What is meant by 'basal metabolism' of the body? How may it be determined in man? Discuss briefly the conditions which effect it. [17]

2. Describe the origin, physiological importance, and fate of *phosphorus* compounds in the living body. [16]

3. What are *tendon reflexes*? What do we learn from an examination of these reflexes? Illustrate by examples. [17]

PART II

1. Describe the histology, distribution, and functions of the 'reticulo-endothelial system.' [17]

2. What are the factors which regulate the tone and permeability of *blood-capillaries*? [16]

3. What effects will you expect in a man who is climbing the height of a mountain? [17]

Second M.B. and B.S. Dergee Examination, 1933

PART I

PHARMACOLOGY

FRIDAY, 1ST DECEMBER. 10 A.M. to 1 P.M.

Answers to PARTS I *and* II *must be written in separate books.*

PART I

1. What are the requisites of an ideal hypnotic? Mention the more important hypnotics, and discuss their relative merits. Prescribe a sleeping draught for an adult suffering from a painful disease. [18]

2. Mention the *injections* official in *B. P. 1932*. Describe the action and clinical uses of each one. [18]

3. Describe the pharmacological action of iodides. [14]

PART II

1. State clearly the actions of alcohol and strychnine on the nervous system, with special reference to reflex activity. [18]

2. Describe and discuss the changes in blood-pressure produced by intravenous injections of—(*a*) adrenalin, (*b*) histamine, (*c*) normal saline. [15]

3. Expectorants: how may these be classified? Give *one* example for each kind, pointing out its mode of action. [17]

Second M.B. and B.S. Degree Examination, 1933

PART II

HYGIENE

FRIDAY, 1ST DECEMBER. 2 P.M. to 5 P.M.

PART I

1. Discuss briefly the importance of vitamins in relation to health and disease. [18]

2. Mention the diseases that may be caused by water.

State the suggestions you would give in the construction of a drinking-water well. [17]

3. Describe briefly the procedure to be adopted in the control of malaria in a locality. [15]

PART II

1. What is ground air ?

How does it differ from the atmospheric air ?

What conditions influence its variations ? [17]

2. Write a short account of—

(*a*) Sub soil drainage.

(*b*) Infantile Mortality Rate.

(*c*) Impounding Reservoir.

(*d*) Nutrient Ratio. [16]

3. Describe a good practical method of disposing of excreta and village refuse for rural areas so as to avoid contamination of wells, tanks, or steams. [17]

Second M.B. and B S. Degree Examination, 1933

PART II

GENERAL PATHOLOGY WITH BACTERIOLOGY

SATURDAY, 2ND DECEMBER. 10 A.M. to 1 P.M.

Answers to PARTS I *and* II *must be written in separate copy books and diagrams should be drawn wherever possible.*

PART I

1. A case of fever of four days' duration is suspected to be of enteric infection. Give a detailed account of the procedure you would adopt in confirming this diagnosis. [15]

2. Describe the post-mortem appearances which may be found in a case of infection with *E. hystolytica*. [20]

3. What are the causes of infarction ? Describe the naked-eye and microscopic appearances of pulmonary infarction. [15]

PART II

1. Describe in their order of sequence the changes in the urinary tract which may follow a chronic stricture of the urethra in the male. [10]

2. Describe the organism of Kala-azar, the laboratory methods by which the infection of man with this parasite can be diagnosed, and the changes in the blood and internal organs consequent on this infection. [20]

3. Write short notes on each of the following : —

(*a*) Cerebral hæmorrhage.

(*b*) Acute yellow atrophy of the liver.

(*c*) Acute hæmorrhagic pancreatitis.

(*d*) The cerebro-spinal fluid in tuberculous meningitis. [20]

Second M.B. and B.S. Degree Examination, 1933

PART II

OPHTHALMOLOGY

SATURDAY, 2ND DECEMBER. 2 P.M. to 5 P.M.

PART I

1. Describe an operation for acute Glaucoma. [17]

2. How would you treat a case of acute Trachoma ? [16]

3. What are the common causes of Secondary Optic Atrophy ? [17]

PART II

1. Describe the clinical appearances of a case of Phlyctenular Kerato-conjunctivitis, and discuss its ætiology. [17]

2. What are the signs and symptoms of a case of acute Iritis ? [17]

3. What are the causes of Lachrymal obstruction ? Give an outline of the treatment you would adopt. [16]

Final M.B. and B.S. Degree Examination, 1933

FORENSIC MEDICINE

FRIDAY, 1ST DECEMBER. 10 A.M. to 1 P.M.

PART I

1. State how the medical witness should conduct himself in giving evidence. [14]

2. Write full notes on putrefaction. [16]

3. Enumerate the factors that may produce suffocation.

Give the post-mortem signs in death due to suffocation. [20]

PART II

1. A man is found in the street in a state of insensibility. Name the various causes to which this may be due. Mention the chief points in differential diagnosis. [14]

2. What is 'infanticide'? Describe the various modes of causing infanticide. In a supposed case of infanticide, describe the mode of examining the chest of the child. Upon what data would you rely for live or still birth? [18]

3. Describe the symptoms of acute poisoning by arsenic, and describe the post-mortem appearances in a fatal case. State how you would treat a case of arsenical poisoning. [18]

Final M.B. and B.S. Degree Examination, 1933

MEDICINE, INCLUDING THERAPEUTICS AND MENTAL DISEASES

FRIDAY, 1ST DECEMBER. 2 P.M. to 5 P.M.

Candidates are requested to write their answers to PARTS I *and* II *in separate books.*

PART I

1. Describe the treatment of diabetes mellitus. [20]

2. Discuss the significance of albuminuria. [20]

3. Differentiate between the commoner diseases in which coma occurs. [20]

PART II

1. What do you know of the etiology of bradycardia? [20]

2. Describe the blood changes which occur in cases of pernicious anæmia. [20]

Final M B. and B.S. Degree Examination, 1933.

SURGERY

SATURDAY, 2ND DECEMBER. 10 A.M. to 1 P.M.

PART I

1. Describe the symptoms, complications, and treatment of chronic suppuration of the middle ear. [17]

2. Discuss the causes and treatment of genu valgum [16]

3. State briefly the pathology and treatment of epididymitis. [17]

PART II

1. What are the causes of dysphagia? Give the methods of examination of such a case. [18]

2. What are the symptoms of tuberculous caries of the upper lumbar region of the spine? State briefly how you would examine a suspected case. How would you treat an abscess occurring in the course of the disease?

3. Give the common causes, the symptoms, and the treatment of paralysis of the musculo-spiral nerve (radial nerve.) [16]

Final M.B. and B.S. Degree Examination, 1933

OBSTETRICS AND GYNAECOLOGY

MONDAY, 4TH DECEMBER. 10 A.M. to 1 P.M.

PART I

1. Discuss the causes and treatment of post partum hæmorrhage. [20]

2. Discuss the etiology, diagnosis, and treatment of retroverted gravid uterus. [20]

3. What do you know of the etiology and pathology of carcinoma of the cervix uteri? [10]

PART II

1. Patient, 40 years, mother of four children, last child eight years, periods regular since. Last period nearly three months ago. Pain in lower abdomen and vaginal bleeding for one week. Discuss the case. [20]

2. Discuss the use and abuse of the obstetric forceps. [20]

3. Give causes, diagnosis, and treatment of vomiting in the newborn. [10]

University of Madras

MEDICAL EXAMINATIONS, DECEMBER 1933.

The following is the list of successful candidates at the Medical Examinations held in December 1933 :—

Note :—Names in italics denote female candidates.

Medical College, Madras.

PRE-REGISTRATION EXAMINATION.

SECOND CLASS.

Rank.	Regr. No.	Name of candidate.
	64	Krishna Rao, B.
2	67	Krishnaswami, A. K.
3	97	Padmanabha Rao, R.
4	116	Ramachandra Reddi, P. V.
5	162	Subrahmanyan, N.
6	99	Paul, P. A.
7	81	*Mukunda Menon, Kamalam*
8	74	*Mahalakshmi*, S.
	96	Padmanabha Ayyar, R.
10	24	*Chandy, Saramma*
11	22	Cadogan, A. J.
12	114	Rama Ayyangar, M.C.
13	38	Hamid, M. A.
	95	Orton, F. G.
15	42	Ittooppunni, P. O.
	122	Ramamurti, D. V.
17	47	Jayaram Rao, D.
18	166	*Sunanda Bai, K.*
19	66	Krishnasubrahmanyam, Y.
20	9	Arumainayagam, C.
	189	Visvanatha Ayyar, P. S.
22	19	Bhadrayya, C.
23	113	*Rajesvari, S. R.*
	174	Toomey, D. J.
25	92	Natarajan, K. J.
26	148	Shamboo Hegde, M.
27	80	Muhammad Taki Khaleeli
	154	Srinivasulu, M.
29	127	Rama Raju, P.
	187	*Verghese, Mary K.*
31	114	Radhakrishnan, P.
32	161	Subrahmanyan, K. V.
	173	Thiruvengadam S.
34	100	Penhearow, Ray M.
35	144	Satur, F. J.
	5	**Anantaraman, L. N.**
	10	**Arunachalam, R.**
	11	***Asirvadham, Josephine***
	13	**Babu, V. B.**
	15	**Balasubrahmanyan, C. S.**
	21	Bhavadasanunni Nayar, K. P.
	40	Haridass, A. K.
	51	Joseph, M. P.
	53	Kesava Pillai, E. K.
	55	Koshy, P.
	60	Krishnamurti, M. V.
	75	*Mahboob Unissa*
	77	Mathew, K. N
	83	Muttukrishnan, C.
	89	Narayanan Nayar, K.
	91	Narayanaswami, T. S.
	94	Ninan Verghese.
	107	Raghunandana, G.
	126	Ramapandiya Raj, V. P.
	145	Savarinathan, G.
	153	Srinivasaraghavan, N. G.
	163	Subrahmanyan, P.
	172	Tiruvengadam, C. R.
	179	Venkatachalam, V. C.
	186	Venugopalan, M. S.

FIRST M. B. & B. S. EXAMINATION.

PART I.

Register number and name of candidate.

193	Anandakumara Menon, P.
194	Annamalai, A. S.
195	Antony, C. J.
196	Antony, P. K.
199	Balakrishna Rao, P.
2 2	***Buultjens Gusta.***
203	Chacko, C. W.
205	Chandroya Chetti, K.
207	Dorairaj, T.
208	*Eapen, Mary*
209	Francis, O.
210	Ganesh Mudaliar, E.
213	Gomez, S. F.
214	Gopala Pillai, S.
218	Karney, P. L.
220	Koshi, K. G.
221	***Krishna Bai, L.***
222	Krishnan, A.
224	Kuriya, A. L.
225	***Lakshmi, S.***
226	Lokanatha Rajah, V.
228	Manikkamuttu, C.
229	Maruthi Rao, U.
230	McNamara, C. W.
231	Mohan Rao, U.
237	Narayana Rao, K.
241	Pushong, E. C.
243	Raghavendra Rao, M.
246	Rajagopalan, V.
247	***Rajamanikkam, H. Mabel.***
251	Ramakrishnan, S. P.
252	Ramakrishnan Tampi, K.
253	Ramakrishna Rao, K.
254	Ramanarayana Reddi, N.
255	Ramanathan, A. N.
256	Rama Rao, K. R.
258	Robello, E. R. F.
262	Satya Joseph, H. A.
264	Shillong, D. W.
266	Sitaraman, N.
268	Sivarama Kini, U.
269	Snow, Dudley J. R.
273	Srinivasa Rao, U.
274	Sriramachandra Rao, C.
275	Subbaramayya, J.
279	Subrahmanyan, R.
280	Subrahmanyan, R.
281	Sundaram, G. A.
283	*Thomas Sarah, T.*
284	Thomas Kuruvilla, T.
287	Tyagarajan, M. K.
288	Venkatachalam, T. N.
290	Visvanatha Rao, S.
291	Eapen, O. G.

PART II.

Rank.	Regr. No.	Name of candidate.
1	383	Ramanathan, N.
2	412	Tiruvenkatachari, S. V.
3	319	Duraiswamy, P. K.
4	333	Janardhanan, P. S.
5	302	Balakrishnan, S.
6	373	Ramachandran, G. S.
7	378	*Ramakrishnamma, Z.*
8	320	Duraiswami, N. S
9	360	Narayanan Nayar, M. K.
10	349	MeNamara, L.
11	339	Krishna Bhat, K.
12	299	Anantan Nambiyar, M.
13	316	Dharmaraj, J. J
14	307	Chacko, A. G.
15	295	Abraham, M.
16	348	Mathew, T. M.
	371	Rajagopalan, G. N.
18	375	Ramachandran, V. S.
19	342	Lakshminarasimhan, K. V.
20	323	Eroman Unni, T.
21	324	Fonseca, P. J.
22	345	Mallesu, G. M.
23	337	Kerala Varma Tirupad, K.
24	358	Narasimhachari, N.
	413	Vasunni Nayar, M.
26	411	Thomas George.
27	336	Kamath, M. V.
	406	Subrahmanyan, N. R.
29	405	Subbarayalu, P.
30	397	Sivaraman Nayar, M.
31	308	Chandrasekharan Nedungadi, P.
32	296	Abraham Paul.
	403	*Subbalakshmi, K. S.*
33	437	Subrahmanyan, V. S.
35	395	Sivanandam, T. V.
36	421	*Venkataswami, Pushpam.*
	297	Achyuthan, T.
	300	Audikesavalu, M.
	301	Audinarayana Raju, S. G.
	304	Bhupendranath Mukhopadyaya.
	305	Bimaneshbhushan Chattopadhyay.
	306	Burby, G. A.
	314	Dalal, I. C.

PART II—(*Contd.*)

Rank.	Regr. No.	Name of candidate.	Rank.	Regr. No.	Name of candidate.
	317	Dhirar, A.		357	Nandlal Bordia.
	329	Gunasagaram, P. K.		372	Rajagopala Reddi, R.
	338	Khot, S. W.		402	Sriramamurti, K.
	347	*Marikar Abusha Bibi.*		404	Subba Rao, M.
	353	Muhammad Jehangir.		414	Velayudhan, A.

SECOND M. B. & B. S. EXAMINATION.

PART I.

Register number and name of candidate.

429 Abdul Sathar Ismail.
431 Babu Rao, A.
432 Balachandran Tampi, R.
433 Bhaskaran, K.
434 Buchinarasimham, M.
436 Chandras khara Menon, C.
437 *Colledge, Merlyn.*
438 Damodera Das, D.
439 Damodara Mallayya, B.
440 Damodara Taravanar, T.
441 Eapen, K. E.
442 *Edwin, E. C. Sarah.*
443 Gangadharan, V.
446 Gopalaratnam, P.
447 Govindan Nayar, K.
449 Isvaran, N.
451 Jagadisan, A. N.
452 Joseph, A. D.
453 Joseph, C.
458 Kumara Menon, K.
459 *Lalita, N.*
465 Munuswami, L.
466 Narasimhachari, R.
468 *Noronha, Teresa.*
469 *Pankajam, L. M.*
470 Paramasivan, S.
471 Parthasarathi, S.
472 Paul, M. A.
474 Ramachandran, V. K.
478 *Rudrani Amma, G.*
480 Sheshappa Shenoi, L.
482 Sivarama Mannadiyar, E.
483 Srikumara Kurup, T. N.
484 Srinivasan, O. V.
485 Subba Rao, K.
487 Sundaresvaran, D.
491 Venkatacharya, P.
493 Ward, W.
495 Kasivisvanadham, K.
437 Natesan, S. M.
498 Venkatasubrahmanyam, C. S.

PART II.

Rank.	Regr. No.	Name of candidate.	Rank.	Regr. No.	Name of candidate.
1	546	Narayana Prabhu, A.	20	527	*Koman, Pushpavalli.*
2	554	Rangachari, P.	21	534	Kutti Ettan Raja, P. K.
3	541	Nagaswami, S.	22	535	*Lakshmikantham, M.*
	558	Sitarama Rao.	23	525	Janardhanan Poti, A.
5	495	Kasivisvanatham, K.	24	505	Basi Reddi, K.
6	503	Balakrishnan, M.	25	570	Varkkey, C. E.
7	545	Narayanan, G.	26	511	*Chinnammu, V.*
8	567	Valisvaran, S.	27	533	Kurien, P. V.
9	536	*Madhavi Amma, P. T.*		579	Visvanathan, G.
10	497	Natesan, S. M.		502	Palakrishna, V.
11	518	Gopala Menon, K.		512	Daniel, P. H.
12	530	Krishnan Nayar, P.		517	George Fletcher, S.
13	526	*Koman, Premela.*		519	Gopalan Nayar, P. T.
14	550	Raman Nayar, M. K.		521	Govindan, S.
15	513	Dhasaradharama Reddi, P.		522	*Grant, May E.*
	542	Narasimhan, M. G.		528	Koshi, K. C.
17	576	Venkatesvara Rao, T.		531	Krishnaswami, A. S.
18	510	*Cheriyan, Mary P.*		532	Ramanuja Ayyangar, N.
19	563	Srinivasan, S.		561	Siva Rao, C. J.
				564	Subrahmanyam, H. S.

FINAL M. B. & B. S. DEGREE EXAMINATION.

PART I.

Register number and name of candidate.

580 Balakrishnan, V. K.
581 Burby, G. E. J.
582 *Cheriyan, Mary T.*
584 George, P. V.
585 Jagannathan, N.
586 Jegaroyan, M.
587 Koshi, C.
588 Krishnamurti Rao, P. S.
589 Krishnan, K. S.
590 Krishnan Unni, T.
592 Manjappa, H.
593 Mathai, P. M.
595 Raghavachari, K.
596 Rajaram, S. R.
598 Ramankutti Wariyar, T. V.
599 Sankaran Nayar, K. N.
601 Sankara Adyanthaya, N.
602 Sumitra Rao, H.
604 Venkatajagannatha Rao, P.
606 Yegnanarayanan, M. S.
607 Achyuthan Pillai, C. A.
609 Balakrishna Pillai, P.
610 Christodas Williams, J.
612 Govindankutti Nayar, A.
614 Kasivisvanathan, P.
615 Keshava Ayyar, K.
616 *Mammen, Mary.*
617 Muhammed Mumtaz Ali.
618 Mukunda Prabhu, S.
619 Raghava Ayyangar, S. A.
620 Rajabather, A. T.
622 Ramakrishna, C. M.
625 Trivikraman, U.

PART II.

The following candidates qualified for the M. B. & B. S. Degree :—

SECOND CLASS.

Rank.	Regr. No.	Name of candidate.	Rank.	Regr. No.	Name of candidate.
1	616	*Mammen, Mary.*		645	Dhanapati, Y.
2	663	Kesavan Nayar, R.		650	Gopala Menon, A.
3	707	Subrahmanya Sarma, A. V.		660	Joseph Selvam.
				666	Krishna Rao, B.
4	640	*Chacko, Lizamma.*		668	Kuriyan, K. T.
5	615	Keshava Ayyar, K.		670	Kuriyan, V. T.
6	705	*Subhadra Devi, I. J.*		683	Padmanabha Pillai, S.
7	704	Srinivasan, T. V.		685	*Parukutti Amma, K.*
8	684	*Pancharatnam, Kanagambal P.*		694	*Rukmini, C. N.*
				698	Sanjiva Rao, B.
	633	Balakrishna Menon, A.		700	Sivasankaran, V.
	642	Damodaran, T.		701	Srikantesvaran, U. V.

The following candidate appeared for the Final M. B. & B. S. Degree Examination, but qualified for the L. M. & S. Degree :—

Register number and name of candidate.

709 * Tharakan, P.

* By combination of results.

SECOND L. M. & S. EXAMINATION.

Register number name of candidate.

456 † Krishnamurti, P.

† Obtains M. B. marks in Pharmacology.

FINAL L. & M. S. DEGREE EXAMINATION.

PART II.

The following candidate qualified for the L. M. & S. Degree :—

Register number and name of candidate.

703 ‡ Srinivasan, R.

‡ Obtains M. B. marks in Surgery.

Acknowledgment.

The following Journals were received :—

Indian Medical Record, Calcutta.

Vizagapatam Medical College Magazine, Vizagapatam.

Medico-Surgical Suggestion, Madras.

Bulletin, South Indian Medical Union, Madras.

The Antiseptic, Madras.

Madras Medical Journal.

King George Medical College, Clinical Society Journal Lucknow.

Law College Magazine, Madras

Bombay Medical Journal.

Sind Medical Journal, Karachi.

Medical Digest, Bombay.

30—1—1934 *Editor.*

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Dated 10th January 1927.

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[Sd.] K. N. GOEL,
Capt. Late I.M.S.,
Medical Officer Incharge,
Civil Hospital.

HYDERABAD SIND,
No. 105. Dated 20th October 1926.
No. 112. Dated 22nd November 1926.

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[Sd] A. J. DODHI, W.M.S.
Medical Officer Incharge,
Women's Hospital.

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20-12 27. (Sd.) R. C. RAWLLEY,
Director of Industries, Govt. Punjab.

3-11-1926.
BHAVNAGAR.

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[Sd.] P. B. MOTIVALO,
Chief Medical Officer,
Bhavanagar State,
Bhavanagar, Kathiawar.

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NAVSARI.
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The D. N. Mehta Parsi-Lying Hospital.

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