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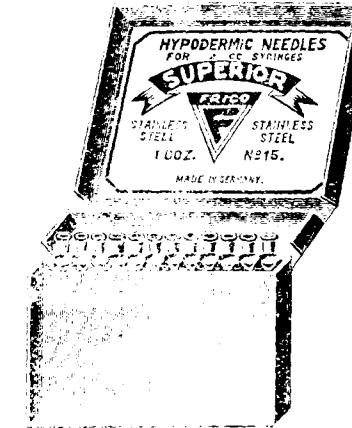
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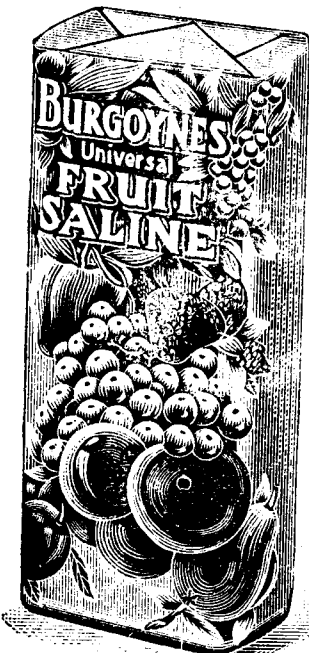
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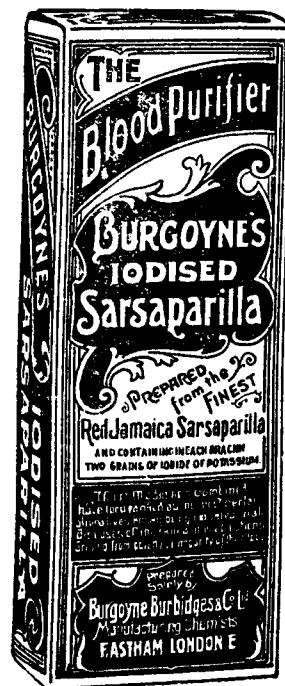
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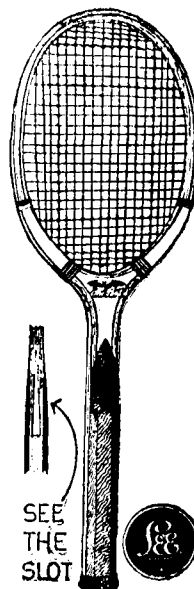
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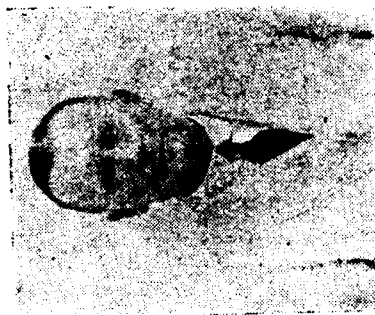
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Lt. Col. W. C. GRAY, M.B., F.R.C.S. (Edin.)



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THE MADRAS Medical College Magazine

Vol. VIII.

JANUARY 1929

No.3

Avertin Narkose*

BY CAPT. A. R. PODUVAL M.B., M.R.C.S.

(Specially contributed)

II

The number of operations conducted under "Avertin Narkose" in Central Europe must now be counted in tens of thousands. The general reports speak very highly of the drug indeed. It certainly has a wide margin of safety, provided, it is given scientifically and under proper control, with the necessary equipments of all kinds of anæsthesia in modern Hospitals, careful watching of pulse, respiration and Blood-pressure.

Preparation of Patient

In our Hospital the patient is given a dose of "Bitter wasser" on the afternoon of the day previous to the operation. The same night, he is given 0.5 gramme of Veronal. Some Surgeons give Castor Oil a day or two previous to the operation; but this is a minor consideration what laxative is used. On the morning of the operation, the bowels are cleaned by a copious enema, sometime repeated, according to the amount of solid matter present. About half an hour before the operation,

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the patient is given a subcutaneous injection of Pantopon (Alcopon in our Hospital). Instead of Veronal some clinics are in the habit of giving Medinal or Phanoderin, the idea in every case being to give the patient a good sleep. Morphine alone 0.02 or with Atropine may be substituted for Pantopon. These are of course meant to lessen the amount of anæsthetic required and to get the patient into a better condition of resignation for the administration of the anæsthetic.

The method of administration

The "Avertin" solution is freshly made up; and this is an essential point. The necessary quantity of Avertin is taken according to the dosage already suggested (0.1-0.15 grm. per kilogr. of body weight) and dissolved in pure water, preferably distilled water and made into a 2½-3 per cent solution. The water may preferably be warmed to 40°C—never higher—and the solution kept at that temperature in Thermos-flasks. In the Eppendorf Hospital, however, we dissolve the drug in 1 per cent Mucilage of Salef. The freshly made solution should be tested for its reaction. Five c. c. of the solution are taken and 2 drops of a 1 per cent solution of Congo red added (Congo test papers will serve as well). There should be no change of colour or any coloured precipitate.

The administration of the anæsthetic is simplicity itself. Any trained nurse can do it. The patient, prepared according to the directions already given, is made to lie on his right side. A rectal tube or a wide bored rubber Catheter well lubricated is passed into the rectum for a distance of 6-8 inches. The Avertin solution is poured into a glass enema with rubber tube attached, and a glass nozzle at the free end. After expelling all the air in the rubber tube, the glass nozzle is inserted into a rectal tube.

and the solution made to flow freely by simple pressure. The whole of the fluid must be made to enter the rectum, by pressing the rubber tube from above downwards. The rectal tube is now clamped, and the nozzle removed. The patient is now made to lie on his back, and the room kept quiet.

For the first ten minutes or so, nothing happens, and the patient may talk as usual, if allowed to do so. But very soon, his eyes begin to get heavy and he looks as if he is going to have a quiet sleep. I have occasionally seen some patients inclined to be talkative while they are getting under the influence of anæsthetic. But I have never yet seen a patient either struggling or getting restless in the course of the action of the anæsthetic. At this time, the eyes of the patient are covered with two or three folds of gauze. In this preliminary stage the reflexes are present, the pupils normal or slightly dilated, the pulse as usual, respiration alone showing a tendency for diminution of frequency. The Blood pressure may drop a few degrees down or may remain normal.

In those cases which exhibit cyanosis, the phenomenon appears usually after the first 10 or 15 minutes; and the colour, in the white races especially may vary from a dull smoky tint to a decided purple, well-marked on the face, and often observed on the finger tips and under the nails. Generally in 15-20 minutes the patient is under the influence of the anaesthetic, and at this stage the pupils are contracted, and the reflexes absent. The blood pressure falls—anything between 5-30 m.m.; but in my experience, this initial fall is followed in 10-15 minutes by a gradual rise, often reaching quite up to the original level. The patient is tested whether he is ready for operation by pinching the skin, and if no response, he is removed to the Operating table.

It is impossible for me to give here the records of pulse, respiration, blood-pressure, and other points that I have noted down in the series of cases that I have seen. This I have to reserve for a future occasion when I hope to write a more detailed account of the subject.

Very often the patient is now under full surgical anaesthesia, and any operation performed with any other usually used anaesthetic may be conducted on him. It occasionally happens, however, that some patients in spite of an appearance of deep sleep still react when pinched with a pair of forceps, even after 20 minutes and in such cases he is given a few drops of Ethyl-Chloride or Aether, by the open method before the operation is actually started. It is astonishing what a small quantity of Aether or of Chlorathyl is sufficient to effect the purpose of complete anaesthesia, and these latter may be entirely withdrawn in two or three minutes. Very seldom, a patient is seen who, in spite of the usual dosage, and the time allowed still remains unanaesthetised and in such cases we have invariably to give Aether or Ethyl Chloride. Usually, however, the quantity of such anaesthetics necessary for complete narkotisation is very much less indeed than without Avertin. Such patients are generally alcoholics.

I have seen the following kinds of operations performed under "Avertin Rectal Narkose". I have personally administered the anaesthetic myself and very frequently assisted my "Chef" in his operations under this kind of anaesthesia.

Head and Neck.—Cerebellar abscess, Krönlein's operation for retro-bulbar cellulitis and cavernous thrombosis; Cancer of cheek, lips, lower jaw; Thyroidectomy;

Upper limb.—Joint operations, amputations, fractures.

Chest.—Radical operation for Carcinoma mammae

Resection of ribs; resection of the right lower lobe of lung for sarcoma.

Abdomen.—Cholecystectomy, gastric resection, intestinal resection and anastomosis, carcinoma of the sigmoid, extra-uterine, &c. &c.

Rectum.—Combined abdomino-perineal operation for Cancer.

In fact all operations can be done under Avertin, as under Aether or Chloroform.

I have often noted, during the course of the operation that the patient occasionally tries to raise his legs. But it is very momentary, and the operation can be safely proceeded with. In long and tedious operations, it may be necessary towards the end to reinforce the Avertin with some other narcotic, generally Aether.

After Operation.

As soon as the patient is taken back to the bed, the rectal tube is removed, and whatever solution remains in the rectum, comes away with it. Then the lower bowel is washed out with normal saline solution through the same tube.

Generally, the patient is asleep, long after the operation and the cleaning out of the lower bowel with saline. But I have noticed none of the troubles connected with Chloroform or Aether—no preliminary struggling, no headache, or vomiting. Patients after waking up from "Avertin sleep" ask for some nourishment, which may be given (according to directions).

Contra indications.

Avertin has its own limits. In the case of the very young and very old, the drug must be given with caution. Low blood pressure is a contra indication as well as pronounced cachexia. Patients with serious functional in-

capacity of the liver and kidneys should not be given Avertin. Acute diarrhoea and dysentery, acute and chronic inflammations of the colon, or ulcers in them are also contra indications to the administration of this drug.

About the application of Avertin in obstetrics and other branches, I shall have occasion to say something later. This article is merely meant as a preliminary attempt to rouse the interest of the profession in India. I have every reason to suppose that it will not be long before the drug is introduced into India; for experiments are already being made to find out its stability and keeping qualities, and how far, and what modifications may be required to allow such a promising drug, a wider range of applicability.

Radium in Gynaecology.*

E. ACHYUTA MENON, L.M. & S. (Madras), L.R.C.P.
F.R.C.S. (Edin)

The use of Radium as a therapeutic agent is a comparatively recent introduction in the treatment of malignant conditions, but has been adopted extensively all over the world on account of the favourable immediate results that have been obtained specially in view of the fact that Surgery is either not available or has given unsatisfactory results in a certain proportion of these cases. It has been further extended to other conditions as well being a measure which causes less suffering and inconvenience to the patient. It has already established its value in the former class of cases, but no unanimity of opinion has yet been reached in regard to various points such as dosage, period of exposure, its ability to cure permanently, etc. All these points only time will settle as also whether any risks and disadvantages which might result from the treatment and which are not known at present. The subject has its special importance in the treatment of cancer in unexposed regions as in the case of the uterus particularly in India. The paucity of symptoms in the early stages of Cancer Cervix, the natural reticence of our women in regard to diseases affecting the genitals, the gross ignorance of the large majority of them, their natural unwillingness to undergo a local examination, the highly reprehensible and almost criminal practice of some practitioners of treating symptoms in such cases without the help of a local examination and before coming to a proper diagnosis—all these causes

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severally or in combination, operate frequently and prevent the patient from having the benefit of the right treatment at the right time with the inevitable result that she leads a miserable existence before she comes to an untimely end.

Out of 53 cases of Cancer of the Cervix that were admitted into the Govt. Hospital for Women and Children in 1927, 38 were inoperable and of the other 15, the majority were borderline cases which were operated upon to give the patient a chance, with the result the primary mortality was over 60% leaving a small minority who were discharged well. For these reasons Radium has its special value as a therapeutic agent for us in this country.

WHAT IS RADIUM?

Radium is a metallic element of high atomic weight 226.5 and was discovered by M. & Mme, Currie in 1898. They obtained it from black oxide of Uranium. The ore pitchblende is found in Congo, Colorado, and Cornwall. The process of extraction is extremely difficult and several tons of it have to be treated to obtain 1 gramme of Radium. This explains why it costs 12 to 13 pounds per milligramme or twelve to thirteen thousand pounds per gramme!

Radium is an unstable element and undergoes a process of exceedingly slow decay, breaking down into bodies of lesser molecular weight and giving off in the process a gas called Radium Emanation which is the source of its radiation. In sealed tubes, the emanation attains a certain pressure which thereafter remains constant. The gas itself apart from the metal has a short life and breaks down and loses its strength by half in less than 4 days.

For therapeutic purposes radium can be used either in this form or in the form of one of its salts namely Sulphate, Bromide or Chloride. The sulphate is most in

se being least soluble and hence least liable to deteriorate in case there should be a leak in the applicator which is inserted into the tissues. It contains 70.2 per cent of the element.

Radium and its salts emit three kinds of emanations, *alpha*, *beta*, and *gamma*. The *alpha* rays are slow moving particles and have a very low penetrating power and are valueless for therapeutic purposes, being unable to pass through the thickness of the wall of the applicator. The *beta* rays also have low penetrating power and are in addition highly irritating to the skin. The *gamma* rays possess highly penetrative properties upto several inches and are the only ones that are useful. Hence,

Radium work one always screens off the *alpha* and *beta* rays by means of suitable filters, made of platinum, lead, silver, aluminium or gold, the salt being enclosed in doses varying from one to twentyfive, fifty or hundred or more milligrammes in sealed tubes of varying thickness made of one of these metals, for example, when platinum is used, the thickness of the tubes will be half to one millimetre.

Dosage

The quantity of Radium used in any particular case, of course, depends upon the nature, extent and microscopical character of the condition for which it is used, and even in the same condition, for example, in Cancer of the Cervix, the question of dosage is still unsettled; the subject of Radium therapy being still rather recent, and sufficiently long experience has not been gained by anybody to enable one to be absolutely sure what is the stimulus amount to use. One may use a comparatively small dose, say 10 to 30 mgms. for a long period, for six or eight days, or one may put in a massive dose of a

hundred, two hundred or more mgms. for 24 to 48 hours. The unit of a dosage is one mgm. of Radium used for a certain number of hours and the total dosage is calculated and recorded by multiplying the number of mgms. of Radium element used by the number of hours for which it is put in. Thus, 100 mgms. of the Radium element put in for 24 hours is recorded as 2400 mgm. element hours.

Action of Radium on living tissues

This is unfortunately not properly understood. When applied to normal living tissues, Radium causes an increase in the activity of the cells, or arrests it or brings about their destruction and degeneration depending upon the intensity of the irradiation and the period for which it is applied. Radium therapy is rendered possible by the fact that pathological cells are affected comparatively more easily in all these three phases, the exact degree of susceptibility varying with different kinds of cells. Hence, dosage is all-important in Radium therapy. Thus, while an insufficient dose may stimulate a growth to increased activity, on the other hand, an overdose may cause damage and destruction of the neighbouring normal tissues, leading to intractable ulceration and causing fistulæ if applied near the viscera. The beneficial changes noticed in the malignant tissues when a proper dose has been applied are the following:—Within twentyfour hours mitosis ceases. Later on the cells undergo abnormal division into several small fragments or undergo degeneration and die out probably as a result of the disturbance of their colloidal equilibrium. Vacuolation of the protoplasm of the cells and of their nucleii, irregularity of the chromosomes, these are some of the changes exhibited by various kinds of malignant

cells. Proliferation of the cells of the Stroma or adjoining normal tissues results from inflammatory reaction and eventually the site of the tumour is occupied by granulation tissue. Fibrosis and scarring takes place which is sometimes however distinctly useful to encircle any small foci of malignant cells left behind and to strangle them out of existence by cutting off their blood supply.

Clinically Radium application, especially if of any length, produces a certain amount of systemic disturbance like malaise, languor, slight rise of temperature, headache, nausea and vomiting. This is probably the result of slight toxæmia resulting from the absorption of the products of disintegration of the tissues.

Modes of application

Radium may be applied superficially to the diseased tissues situated more or less deep from the surface—*superficial therapy*, or the Radium needles may be buried into the tumour itself—*Deep therapy*. The advantages of superficial therapy are that it lessens chances of dissemination of the growth which may take place when the tissues are cut into and that there is no liability for the introduction of sepsis into the tumour. But in order to get the best results the proximity of the destroying agent to the diseased tissue is essential. The dissemination which takes place through the circulation operates only momentarily and probably the system is quite capable of dealing with the small masses of emboli and embolism for ought we know might be taking place though in lesser amount under normal circumstances. In any case, this disadvantage appears to be sufficiently compensated for by the advantage obtained by more efficient destruction of the cells resulting from greater intensity and more even distribution of irradiation obtained by the deep method.

to educate the masses as regards the early symptoms of the disease.

Preparation of the patient

Before Radium treatment is undertaken, it is essential to make a thorough preliminary examination of the patient to see if her vitality is such that she can tolerate the treatment as the extensive cell destruction and subsequent absorption of the products of disintegration will cause a heavy strain on the kidneys. Pronounced anæmia is a distinct contra-indication as irradiation causes definite blood changes which may be distinctly harmful. Marked diabetes with excretion of over an ounce of sugar in the 24 hours with the presence of Diacetic acid in the urine, and the presence of sepsis in the area to be irradiated should also be considered as danger signals. Acute inflammation which is often present at the growing edge of the tumour should be treated first. Hence, the following preliminary measures should be undertaken :—(1) General physical examination (2) Urine examination (3) Renal function tests (4) Blood count and Hæmoglobin estimation (5) Study of Blood chemistry (6) Removal of a piece of the tumour for microscopical examination (7) A cystoscopical examination to see if the bladder wall is to any extent affected. Marked infiltration contra-indicates Radium as the tissues may break down after Radium application causing a vesico-vaginal fistula (8) Similarly, the rectum should be examined to exclude marked infiltration into its wall (9) A blood transfusion may be necessary if the patient is particularly anæmic (10) If there is much offensive discharge this should be treated by douches with Lysol or Iodine lotions for several days. Sloughs are removed or the ulcerating growth touched up with pure carbolic acid (11) Before the insertion the rectum and lower bowel are emptied by one or two

enemata and just before the patient is taken to the table the bladder is emptied.

Technique

With the patient in the lithotomy position an intra-uterine applicator containing the requisite dose is inserted into the cervical canal with the help of a posterior speculum, if necessary, after preliminary dilatation of the cervix by means of a few metal dilators. In the latter case an anæsthetic may be necessary. More Radium needles are utilised to obtain a cross fire-action with the emanations from the uterine applicator either by putting in a solid rubber ring pessary in the vault of the vagina containing the requisite amount or when deep therapy is contemplated by their insertion direct into the growth in the cervix. The method used in the Govt. Hospital for Women and Children is the former. Some idea of the unsettled state of the question of dosage and timing can be obtained from the fact that while Kelly's Hospital Baltimore, uses upto 1200 mgms. for 1 to 3 hours and another Hospital in Boston puts in 300 to 800 mgms. for 3 to 8 hours, the Mayo Clinic uses 50 mgms. for 14 hours repeating it 8 to 12 times at two or three days' intervals and the Radium Institute in Paris keeps in 60 mgms. for 6 days. The insertion of a massive dose may be alright in some cases when you implant the Radium into the growth direct, but in a case where the degree of infiltration cannot be very accurately judged, it may injure healthy tissues very badly. The chances of doing so when repeat treatments are done are much less because at every insertion the applicators are shifted slightly especially when the cicatrization has resulted from previous insertions. We put in 30 to 50 mgms. for 24 to 48 hours in one or two

uterine applicators and 25 to 50 in a pessary. As regards the pessary it is essential to have one just the proper size, as an illfitting one is very liable to get displaced and to cause serious burns to healthy tissues such as those of the bladder, vagina, or rectum. The vagina is plugged with idoform gauze to prevent displacement of the applicators and the flexible wire attached to the uterine applicator comes out of the vagina and is bent over the front of abdomen and is fixed there by strapping. The patient is carried to the ward on a stretcher and is enjoined to lie on her back all the time the Radium is in. After 10 days she is given another similar treatment which is again repeated after another 2 or 3 weeks. She gets antiseptic douches and symptomatic treatment in the intervals. She is then advised to go home and to come back in three months for examination for further treatment.

Other vaginal applicators one has seen used are flat and made of platinum and slightly curved to fit the convexity of the cervix on either side of which one or more are applied, gauze plugging being again used to prevent displacement. In one Clinic they dispense with the use of a vaginal applicator relying on the uterine applicator alone. This is not quite so efficient as the other methods where cross fire action is provided for. Others again enclose the Radium needles in a small piece of rubber tube which after securely tying the ends, they use as the uterine applicator. Implantation of the needles into the cervix can be secured by the applicator like the one devised by Willis. This contains a metal collar which can be fixed to the wire stem holding the intra-uterine applicator, the collar which rests firmly against the cervix having six holes near the periphery through which the needles can be introduced.

Results

It is admitted on all hands that as a palliative measure Radium therapy is invaluable. In the Govt. Hospital for Women and Children, we have been using Radium generally only in inoperable cases and our experience is in agreement with that of the others. In most cases pain is relieved in the course of a week or ten days and disappears after 2 or 3 treatments. The discharge whether sanious or serous at first shows a slight increase but gradually becomes less in quantity and offensiveness. Coincidentally with this improvement the patient's general condition also improves, the appetite returns and she is better in every way. Locally, ulceration begins to heal up, the zone of infiltration becomes gradually smaller in extent, scarring results and in a few favourable cases, no evidence of the original growth is seen but for the scar. In the cauliflower type the growth diminishes in size and may disappear. It is far too early to say how long the relief obtained in these cases will continue as we started radium treatment in the above Hospital only recently. So far 53 cases have been treated, of which 4 were apparently cured, 15 were much better, 28 relieved to a more or less extent, 5 died and 1 was discharged moribund. Taking into consideration the fact that all these 53 were inoperable cases and would in the natural course of events have had but a few months of miserable existence before them, the above result is not discouraging and with improvement in technique and dosage for which there is ample scope, one can hope to get better results. The cases that died were all of them unsuitable cases for various reasons and the treatment was adopted for want of anything better to afford them the least possible chance. Among the large number who are shown as re-

lieved, the large majority have had only one course of treatment, getting discharged from the hospital after a short stay against advice. It is perfectly obvious to those acquainted with hospital patients that it is very difficult for us to follow up our cases. But it is hoped that when the results of the treatment become better known such difficulties will slowly diminish. Cases have been reported in Current Medical Literature where the patient has been from recurrence for as many as five or six years.

Pre-operative irradiation has been advocated in the borderline cases, the operation in such cases being performed 3 or 4 weeks after the insertion of Radium. It is said in such cases that the outlying areas of malignant infiltration become less in extent and the case becomes operable and also that there is less risk of recurrence after operation, though the operation itself may be rendered more difficult on account of the fibrosis which results.

Post operative irradiation is also recommended after the wound has healed up to prevent recurrence. Recurrence when they do occur, are also treated similarly, preferably by implantation which may be done after reopening the abdomen.

Reaction, complications, risks and sequelae

The patient very often complains of headache which, however is not severe. Other symptoms of systemic disturbance such as nausea, vomiting, languor, also occur in some cases. In about 40% of cases there is a slight rise of temperature up to 100° or 101° F coming a few hours after insertion and lasting for a few days. A small percentage have a higher rise ranging upto 102° or 103°. Most of the patients complain of slight pain and discomfort in the lower part of the abdomen. Generally they have no difficulty in emptying the bladder but a few

have frequently of macturition and occasionally catheterisation may have to be done for retention. Diarrhoea with Tenesmus and the passage of mucus in the stools is sometimes a complication which lasts for four to eight days and has to be treated by starch and opium enema. Septic complications like abscess formation in the Parametrium, Pyometra, and septic peritonitis have been reported to occur very rarely. Severe secondary haemorrhage caused death in one of our cases. Thrombosis of the Pelvic vessels leading to oedema of one or other lower extremity occurs in a small number of cases, and may result in death from embolism. On the contrary, pre-existing oedema of the legs due to malignant or inflammatory—possibly the latter—infiltration of the parametrium disappears as a result of the treatment. Burns and fistula formation and intractable ulceration have been already referred to as resulting from dislocation of the vaginal applicator. Fistulae may also result from the breaking down of tissue previously infiltrated with extension of the growth, such a case being obviously unsuitable for Radium treatment.

Severe fibrosis in favourable cases may be so bad as to cause contraction of the vagina and rectum which may require repeated dilatation.

Radium treatment in cancer of the Cervix complicating pregnancy has been adopted in certain inoperable cases discovered in the last few months in order to save the child and is reported to have been successful. But its adoption in the early months with a similar object is not advisable as Murphy in an article in a recent issue of "Surgery, Gynaecology and Obstetrics" reviews the literature on the object and brings forward experimental and clinical evidence to show that serious developmental disturbances are produced in the offspring of the experi-

mented animals and that in human beings irradiation of the pelvis brings about arrest of development of the brain of the foetus resulting in conditions like microcephaly. He advises the use of Radium in pregnant women only when it is proposed to terminate pregnancy before the child becomes viable.

Cancer of the body of the Uterus

Surgical removal is still the best method of treatment in this disease, but in cases that are unsuitable for operation Radium may be used by intra-uterine applicators putting in about 60 to 100 mgms. for 24 hours.

Fibroids of the Uterus

The use of Radium for uterine fibroids stands on a different footing from that in Cancer. Firstly, surgical treatment is not attended with anything like the primary mortality that is seen in Carcinoma and moreover holds out a prospect of complete cure without necessarily causing sterility in every case provided the patient's general condition permits its adoption. Further, the stoppage of ovarian function with the nervous symptoms attendant thereon and the resulting sterilization are important considerations in the case of women suffering from a condition which is not so destructive of life as cancer. Add to this the fact that there may be risks yet unknown resulting from the use of Radium in women during the child-bearing age. Furthermore, Radium does not relieve to any great extent the pressure symptoms caused by those fibroids which contain more fibrous than myomatous tissue. Besides, the difficulty of finding out the extent of degenerative change and the degree of perimetritic inflammation which may be present is also considerable. These questions have naturally

tended to limit the use of Radium in this condition to certain well-defined indications.

(a) In Women nearing the climacteric or past the menopause when persistent bleeding is the predominant symptom, when the fibroids are small or of medium size and are soft and not subject to inflammatory or degenerative changes, Radium irradiation is probably the method of choice, always keeping in mind the possibility of malignant change that may be present or might result from insufficient dosage.

(b) Further, Radium is indicated in patients who from heart or kidney disease or other complications are poor surgical risks and

(c) when surgical intervention is refused.

Dosage.—50 to 70 mgms. properly screened are introduced into the uterine cavity by means of an intra-uterine applicator and cross fire-action is secured by using 50 to 100 mgms. externally over the lower abdomen and kept on for 24 hours. A repeat dose of similar amount is put in after 2 or 3 months. I have had no personal experience in this class of cases.

In Metrorrhagia resulting from chronic metritis and fibrosis of the uterus occurring in women during the child-bearing period or from excess of ovarian function as an alternative to hysterectomy, Radium has been recommended:

Case:—L. B. Hindu 25 years married 6 years, no children. Metrorrhagia started some time after marriage. Retroverted Uterus—corrected by operation. Had D & C done twice. Glandular therapy proved a failure. It was impossible to stop the bleeding which was going on almost continuously. Wasserman negative Hysterectomy refused. 25 mgms. of RaSO_4 for 24 hours on 2 occasions at intervals of a fortnight stopped it. She had

a normal period sometime after the stoppage of the metrorrhagia which lasted only 5 days. The case being a recent one, the history of future periods and her sexual history are looked forward to with interest. It should be possible with experience to give the optimum dose and just the desired amount of irradiation to bring the menstrual discharge to the normal level.

Radium has been suggested and reported to have been used in Epithelioma of Vulva and Vagina and in Erosion of the Cervix, Pruritus and Leukoplakia of the Vulva.

Carcinoma Breast

Post operative implantation of Radium needles has been practised as a routine by Sampson Handley in areas where recurrences are likely to occur after a radical operation for this condition *viz.*, in the anterior mediastinal and in the supraclavicular lymphatic glands. At the end of the operation he inserts one tube of 25 mgms. into the supraclavicular triangle superficial to the subclavian artery, and one each of the same dose into the intercostal muscles at the inner ends of the 1st, 2nd and 3rd intercostal spaces.

Local recurrences after operation have also been treated with Radium. In one such case treated at the Government Hospital for Women and Children, superficial therapy was adopted. The technique used for which I am indebted to Capt. Barnard was as follows: The needles or plaques of the requisite aggregate dosage are inserted into a pad of Bees wax 1 to 2 inches thick and of the requisite shape, care being taken in their distribution to secure proper intensity of irradiation to the different parts of the growth. The pad is then moulded to the part and is then wrapped with oiled paper and

strapped with sticking plaster for the sake of security and is then applied over the tumour or ulcer with a few layers of lint intervening and fixed by means of a many-tailed bandage. A sheet of lead rubber is placed over all to cut off external radiations. Three such applications of 50 to 80 mgms. were used with the result that pain, enlarged axillary gland and oedema and thickening of the skin of the arm disappeared; but the tumour itself showed only slight diminution in size. Deep implantation of 50 mgms. has been done into the tumour for 48 hours and the result is awaited with interest.

In a case of inoperable scirrhus carcinoma of the breast which had ulcerated, superficial therapy caused diminution in the induration and the ulcer had almost healed up and the pain relieved when the patient left the hospital.

I desire to express my thanks to the Superintendent, Govt. Hospital for Women and Children, for his kind permission to utilise the records of the hospital.

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Leprosy*

BY S. THAMBAYYA M.B., B.S.

History

Earliest endemic area of leprosy is Soudan. Authenticated records show that a belt of land bordering on the South-eastern part of the Mediterranean was infected from Soudan with Leprosy which spread far and wide through affected persons carrying it to countries previously free. Ancients were able to isolate Leprosy as a separate disease so early as 4,000 B. C. and prescription of oils was used in its treatment. From the Biblical description, 'unclean' 'loathsome', 'white as snow', scaly, 'cleansing of lepers', one is forced to conclude that under the heading of Leprosy a heterogenous group of diseases was included such as Psoriasis, Leucodermia, and even Albinism. This conclusion is greatly strengthened through recorded cases of cure, for Leprosy, as understood now, was an incurable disease and the cleansing of a leper meant that the person was cured of his Psoriasis. Munro quotes an Egyptian Record of 1350 B. C., during the reign of Ramses II, to show that Leprosy was prevalent among the Negro slaves of Soudan. In India, reference to Leprosy under the name of 'Kusta' is found in the Vedas, computed to be written about 1400 B. C. There are also references to 'Ven-Kusta' which can only refer to Leucodermia or Albinism. This shows the ancients included many skin affections under the heading of Leprosy. Again, Chinese writings of 1500 B. C. make no reference to Leprosy, but numerous records show that Leprosy was prevalent in the South Eastern parts of

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modern China, which was in trade communication with India about 250 B. C. A certain amount of confusion seems to have risen in the translation of the Biblical term "Zaraath" which, as pointed out above, included a number of diseases as Psoriasis, Leucodermia, etc. This word was translated into Greek by the word "Lepra" which was exclusively used to mean 'Scaby disease'—Psoriasis.

Spread of disease.—Egypt was opened for Greek communication by the conquest of Cambyses in 525 B. C. and this was followed soon after by the conquest of Oarius. Close relationship between Egyptians and Greeks carried the disease into Greece. The expeditionary forces of Xerxes, in 480 B.C., drawn from all the nations of Asia and Africa under his rule, helped the spread of Leprosy into Greece and Southern or rather South-Eastern parts of Europe, as thousands of his soldiers and camp followers were left behind in Europe during his retirement. Pompey's soldiers from the East in 62 B. C. carried the infection into Italy, which was hitherto free. During the ascendancy of the Roman Empire, Spain became infected through Roman troops sent out from Italy for garrisoning duty. Then came the Saracen Invasion which carried the disease through Spain, and into France across the Pyrennes. England may have been infected about the same time as France. Earliest leper hospital was established in Nottingham about 630 A.D. Though it took some time in its spread into Scotland and Ireland, the latter countries became infected in their turn and remained so till the end of 16th century.

Crusaders, about the end of 11th, 12th and 13th centuries, contributed their share in the spread of the disease through Europe after being infected from Palestine.

From records and investigations it is concluded that the Western Hemisphere was free from Leprosy till the advent of the European discoverers and immigrants. Early discoverers and settlers of Europe originally came from Spain and Portugal, countries heavily infected with Leprosy during the 15th and 16th centuries. One more factor was also in operation during these centuries and the one succeeding them. It was the slave-trade. Spanish Jews of wealth were engaged in slave-trade and the slaves were mainly drawn from western and central Africa, which were then extremely infected and still remain so.

The spread in an easterly direction was brought about by the Chinese sea-faring and trading population of South China. Most of the Pacific Islands were infected by Chinese immigrants. Arab traders may have infected the west coast of India. Muhammadan invasion was mainly responsible for the spread of the disease in the Northwest and North India. Chinese infection may be through India, and the caravan traders of Central Asia, who were constantly in touch with Egypt, Palestine and Turkey.

Present geographical distribution: The disease is mainly confined to the sub-tropical and damp hot tropical climates. Sporadic cases, mainly imported, occur all over the world. The following areas show a high incidence:—

1. Equatorial Africa shows the highest rate per mile in the world. Special areas French Ivory Coast, French Guiana, Nigeria, Soudan and Abyssinia.
2. Assam, Burma, Federated Malay States, Indo-China, South China and East Indies.
3. West-Indies and North of South America.

Aetiology:—Leprosy is a communicable disease,

requiring prolonged and intimate contact. Heredity plays no part is now established beyond dispute. Age-period of 1 to 20 is the most susceptible period, although infection may occur at any age. Incubation period may extend from several months to many years hence the difficulty experienced in tracing the source of infection as compared with the few days' incubation of most of the infectious diseases. Average incubation period, under natural conditions, is 6 to 8 years. In authenticated cases of direct inoculation of doctors while operating on lepers, the incubation period is short, ranging from 6 weeks to 3 months: in all these cases the early manifestation of the disease was of the anaesthetic type preceded by febrile disturbances and local lymph-adenitis.

Both sexes are equally susceptible. Males quite frequently lose their procreative capacity through testicular atrophy, while women continue to remain fertile.

Hot humid climate, insanitary and over-crowded dwellings; unbalanced dietary and stage of civilization of the individual are accessory contributory factors in the spread of the disease.

Insects, flies, bugs, mosquitoes and fleas, do only act as mechanical carriers of infection. Biting and sucking insects may successfully implant the *Lepra bacilli* in their role as mechanical carriers.

In cold climates where the people are necessitated to be well clad, the mode of entry of infection is through the mucus membrane of the nose. In hot countries where people are sparsely clad, the entry is through the skin: In 80 to 85 per cent of infected cases, the infection takes place through cuts and abrasions of the feet.

Pathology.—Leprous nodules are granulomatous infiltrations of the corium and hypoderm: (compare similar lesion of syphilis and tubercle). *Lepra bacilli* are found

in large numbers in the nodules strongly contrasting to the sparsity of organisms in lupus.

Bacilli are found in lymphatic glands, spleen and kidneys. Chronic nodular-type of cases give rise to lardaceous disease of kidneys, liver, spleen and bowels.

In Nerve-type, interstitial tissues are inflamed and hyperplastic, giving rise to thickening, fibrosis and degenerative changes in the nerves supplying the affected area. This leads to atrophy of muscles and trophic changes of skin. W. R. is positive in good many cases.

Bacillus Leperae

The causative organism of Leprosy is *Bacillus Leperae* (mycobacterium *Leperae*) discovered by Armour Hansen in 1871. It is an acid-fast bacillus.

The vegetative form is a uniformly staining straight or slightly curved rod, 1 to 8 μ in length. Longest bacillus is equal to the diameter of a normal R.B.C. Stained specimens from nasal mucous membrane or clippings from skin nodules show the bacilli in bunches or cigar-bundle shapes. Single ones resemble the Tubercle bacilli very closely.

When morphologically altered, the following appearances are met with :

1. Very slender rods, uniformly stained.
2. Diphtheroid rods with bi-polar staining.
3. Beaded rods resembling a string of beads.
4. Spore-like forms with and without rods projecting.

Preparation of specimen

1. Nasal smear. Normally the mucous membrane of the nose is red and moist. If the mucous membrane appears dry, it is difficult to demonstrate the bacillus in the smear, for, it corresponds to the skin lesion of ascending

Nerve type. If on the other hand, the mucous membrane is exceedingly red, swollen and nodular, or ulcerated, smears from scrapings will give positive results. The best area to scrape is the ulcerated part or the mucus nodule at the junction of the bony and cartilaginous parts of the septum. I need not mention that a nasal speculum is indispensable, and a Volkman spoon may be used.

2. Skin lesions: Nerve type with the circinate, depigmented patch usually yields negative results. Skin nodules may be punctured with a fine glass pipette and smears made; or a teasing-needle will also answer the purpose. The point of the needle must be driven well into the corial layer and cellular exudate pressed out through the needle track for smears. The patient does not feel the prick of the needle and will not make any objection.

The best method is to make a skin clipping with a pair of scissors, curved on the flat, and the clipping should include the corial layer as the *Lepra* bacillus multiplies in this layer.

When no cutaneous nodules are present, a blister may be raised near the margin of an erythematous depigmented anaesthetic area. Then the bleb is cut away and smear made from the raw corial surface.

Skin clippings from nodules yield the best results. Then comes nodules and ulcers from the mucous membrane of the nose.

Staining. Fix by lightly flaming.

Acid fast staining, Ziehl-Neelson's stain, is used. Smear is covered with basic carbol fuchsine. Heat till steam appears and cool. Repeat process for fifteen minutes. Decolourise in 15% H_2SO_4 , not 20% as used in Tubercle Bacilli staining, for 1 to 2 minutes. Counter stain for 1 to 2 minutes in methylene blue.

The above-described method of staining for 15 minutes with carbol fuchsin if carefully carried out, granulation and gonidia forms, if present, will be brought out clearly. When they are present in great numbers, it is an indication that the bacilli are being destroyed, and one will be justified in looking out for a favourable prognosis.

Signs and symptoms.—It is customary to divide the disease into three types: (1) Nodular, (2) Anaesthetic and (5) Mixed type. Advanced cases are easily recognised. The leonine appearance of the face, thickened and nodular pinnae, particularly the lobules, shiny skin, and depigmented patches of skin together with a pronounced thickening of the skin of the palm and soles of the feet cannot fail to lead one to a correct diagnosis. Later on, the hideous mutilations of fingers and toes, perforating ulcers, blindness, blister, fungating ulcerations, and paralysis making the sufferers so repulsive and loathsome, are well known.

I shall particularly endeavour to place before you the signs and symptoms of early cases, as it is only these who have the best chances of recovery if proper measures are instituted in time. Two factors make early diagnosis easier as compared with other diseases. First, the lesions are on the surface of the body and not in the internal organs. Secondly, in India, the early anaesthetic and depigmented patches are comparatively easy of recognition, and if the public are sufficiently educated, competent medical advice can be sought early.

There are preponderating evidences to show that primary infection of the *Lepra* bacillus takes place through breaches in the epithelium of the skin and mucous membrane of the nose. In hot countries like India, a large number of infections appear to take place through

the skin. When the bacilli are a few in number, as is the case at the time of primary infection, anaesthetic patches are the earliest to appear, and, in favourable cases, when the bacilli multiply in large quantities, nodules are produced. Hence one will be justified in looking out for the two important signs in the diagnosis:

- (1) Anaesthetic patches.
- (2) Demonstration of *Bacillus Leperae* in the lesions.

The latter has been noted in detail together with the staining peculiarities.

Anaesthetic patch.—For purposes of diagnosis, it is sufficient to confine ourselves to the sense of superficial touch. This is best carried out with a wisp of cotton-wool wound to the end of a match stick; or a spill of paper may serve the purpose quite as well. Patient should be blind-folded and asked to indicate the different parts of the body touched with the top of a finger. This method is preferable to the usual one of asking the patient whether he feels the part being touched or not; and can also be applied in cases of patients with low intelligence. It is hardly necessary to point out that, if the patient indicates the spots touched correctly, no anaesthesia is present; but instead, if the patient touches a part at a short distance from the spot touched, paraesthesia is present. Paraesthesia is usually elicited when the circumference of an anaesthetic patch is touched, and is due to a collateral innervation of the part under investigation.

Sometimes hyperaesthesia and thermal anaesthesia may be present, and this will necessitate to keep the patient under observation till more definite signs of the disease appear.

Anaesthesia and presence of *Lepra* bacilli are two essential points in the diagnosis of the disease and it is

very rare to find cases where one or other of these points are absent on careful search. A few accessory signs of less importance may be looked for. These are:—

- (1) Thickening of Nerves
- (2) Absence of sweating
- (3) Depigmented patches
- (4) Hyper-keratosis or Parakeratosis

(1) Thickening of nerves: Three nerves are usually affected—Great auricular, Ulnar and Superficial Peroneal.

(2) Absence of sweating: Anhydrosis is noticed particularly in the anaesthetic patches, hands and feet. Some patients may complain of excess of sweating of the trunk while the extremities are anhydrotic.

(3) Depigmented patches: This is often the earliest sign of Leprosy, and, the patient with a deeply pigmented skin, is able to note the change and seek early advice. Depigmented patch, in a well-defined lesion, has three distinct areas: "an outer depigmented ring surrounding an inner erythematous ring with a depigmented patch in the centre". There may be variations in the extent of the rings. Sometimes trophic blisters on the hands and feet are the first lesions, but this is rare.

(4) Parakeratosis and Hyperkeratosis: "Para-keratosis is recognised clinically by certain changes in the horny layer of the epithelium. There is a shiny appearance of the surface of the skin, often accompanied by appearance of scales. The stratum corneum is not of its usual smooth, elastic consistence; the cells retain their nuclei and adhere to one another, so that, they are not shed individually but as scaly masses".

Hyper-keratosis is an abnormal thickening of the epithelium of the skin. Palms of the hand and soles of the feet are specially attacked. The thickening causes cracks and fissures, particularly in the creases, and

gives rise to the most superficial variety of perforating ulcers.

Distribution of Leprous lesions in the body.—Parts most exposed to the atmosphere are first affected. In India, face, hand, and feet are more liable to be affected.

Ears are perhaps more constantly affected than any other part of the body. In suspected cases, the lobules should be carefully examined and also the great auricular nerve, which is about $\frac{1}{2}$ to $\frac{3}{4}$ inch behind the point where the external jugular vein hooks round the posterior border of the sterno-cleido-mastoid muscle. It is easy to palpate nodules in the lobule of the ear and also to snip off a piece of skin for microscopical examination.

The ulnar nerve thickening comes next in order. Perhaps its homologue in the lower extremity, the peroneal, is also as frequently affected. People who walk bare-footed are infected through abrasions and cuts in the feet and legs. Nasal affection is commoner in cold climates. A note-worthy fact in connection with the distribution of leprosy in the body is the complete freedom of hairy Scalp from Leprous lesions.

Diagnosis: Advanced cases of leprosy are easy of diagnosis. Of the early cases, nodular type has to be differentiated from Lupus Vulgaris, nodular syphilis and rarer forms of granulomatous lesions caused by vegetable organisms.

Syphilitic nodules are redder, smaller and progress rapidly. Wasserman reaction may be positive in Leprosy as in syphilis. History may be helpful. *Leptra bacilli* can be easily demonstrated by carefully prepared specimens as described above. One may look for thickened nerves. In Lupus Vulgaris the nodules have the 'apple-jelly' character, the course is chronic and the affection is common during child-hood. Lupus Vulgaris

is not common in South India. Blastomycosis and Sporotrichosis usually tend to break down and suppurate. A smear from the pus will demonstrate the presence of the organism.

The anaesthetic type has to be differentiated from Tineas, Leucoderma, Scleroderma, Syringomyelia, and Morvan's disease, premycosis stage of Mycosis fungoides etc. In leucoderma, there is loss of pigment without atrophy of skin. In scleroderma, the margins have a characteristic lilac or pinkish tint and the whitish areas are of an ivory colour. Except in leprosy, all these conditions do not give rise to thickening of nerves, ulnars, great auricular and peroneals. The premycosis stage of Mycosis fungoides is characterised by intense itching and the eruption is a generalised erythrodermia, or localized eczema or scaly seborrhoeic. When the tumours develop, they are much larger than leprosy nodules. Consistence is softer and easily break down and suppurate.

In Syringomyelia, there is loss of sensibility to heat, cold and pain, while that for touch, posture and vibration frequently remains unaltered. The anaesthesia, in leprosy occurs in patches as regards superficial tactile sensibility: the patches are depigmented in the centre and the ulnar nerve is thickened and sometimes nodular. Morvan's disease is now considered to be a special variety of Syringomyelia with trophic changes in the form of painless witlow. No *Lepra bacillus* was ever demonstrated from the witlow.

The tineas are an important group in the tropics and should be carefully excluded. Attention should be directed to the following points:

- (1) Itching—Ringworm fungus gives rise to intense itching.

- (2) Progress—Tineas spread much more rapidly. Leprous patches increase more slowly.
- (3) Causal organisms. Ringworm fungus should be looked for in suspected cases of Tineas.

Tinea is essentially a disease of the epidermis and leprosy a disease of the corium. In ascending nerve type of leprosy anaesthesia and depigmented patches are easily elicited. The nerve supplying the area may be thickened. Anhydrosis may be a useful earlier sign of leprosy.

Pityriasis versicolor closely resembles the depigmented patches of leprosy. It is caused by *microsporon-fur-fur* which is easily demonstrated by microscopically examining scrapings from skin and mounting in liquor potassae. Itching; fine braun scales and the fawn colour of this lesion may help. Psoriasis and Erythema Nodosum have a claim in considering the differential diagnosis.

Treatment

This resolves into two main headings:

- (1) Curative
- (2) Prophylactic.

Curative. The number of drugs used in the treatment of this disease is enormous. There is no doubt that some of them were only palliative remedies and stayed the rapid progress of the disease, but most of them were empirical, enjoyed an ephemeral fame and later abandoned. Mercury, Arsenic, Antimony, Thymol, Ichthyol, Guaiacol, Strychnine and Cyamocuprol are some of the drugs capable of producing a certain amount of beneficial effect. Of the old remedies, potassium Iodide has still a place in the treatment. Local treatments by ointments, baths, X-Ray, Radium, and high-frequency and galvanic electric currents were also tried

at different times, and none of them has left any impress about its usefulness.

Specific serum of Carasquilla, and anti venomous serum of Dyer had their vogue and left no lasting result. Normal Horse serum was also tried.

Vaccines, both non-specific and specific forms, were used with varying results. Of the non-specific forms of vaccine therapy. Tuberculin, Nastin and Nastini B of Deyeke, and T.A.B. vaccine may be mentioned.

Specific vaccine therapy requires a culture of the lepra bacillus, which so far has resisted all attempts at cultivation. Hence whatever claim that has been made under the heading of specific vaccine therapy is really a non-specific one like Nastin etc. Well-marked local and general reactions were produced by Clegg's Vaccine and Rost's Leprolin; one should also remark that Deyeke's Vaccine produced equally good, if not better results, as compared with these. In short, the various vaccines failed to give constant and lasting benefit in leprosy. We now rely on Non-toxic vegetable substances to produce local and general reactions, and some of the results obtained show that, in the near future, something of a specific may be evolved to combat this dreadful disease.

Though leprosy is known in India as "the great disease" on account of its incurability, its protracted course and its loathsomeness, Indian physicians were using different oils in the treatment of the disease. While the north Indian Kavi Rajs and Hakkims used chaulmoogra oil and gurjan oil, their brother pandits and Vaidyans of South India were not behind times. The South Indian Pandits prescribed *Hydnocarpus whitiana* (ஹைட்னோகார்பஸ்) in gradually increasing doses for internal administration and baths twice a week, after smearing the whole body with the same oil. The oil was got rid off from the body

during bath by rubbing soap-nut powder. Leprous nodules and anaesthetic patches were regularly painted with the juice of *semicarpus Anacardium* (சேங்கைட்டை), Dhoby's marking-nut). The Malabar Vaidyan used the oil of *Hydnocarpus Inebrians* (ஹைட்னோகார்பஸ்), as this tree is indigenous in Malabar coast. Otherwise, the treatment was same, except in special cases special oily preparations were prescribed for anointing the head before the regular weekly baths. Most of the patients were unable to continue the use of the oil internally on account of the severe gastro-intestinal upset (and other dietary restrictions). As most of the Vaidyan's medical books were translations of Sanskrit Ayurvedic works, so one finds a good deal of similarity in the Materia Medica of the Indian physicians.

The above method of treatment has existed in South India for over 600 years.

Sir Leonard, Rogers, in a lecture delivered before the Royal Society of Arts, said:—

"As early as 1854 the attention of English Physicians was drawn to old Indian remedy for Leprosy, chaulmoogra oil, *Taraktogenos Kurzii*, while Phillipine workers showed later that the seeds of various species of *hydnocarpus* contained the same active principle, chaulmoogric and *Hydnocarpic* acids, first isolated together with *genocardic* acid by power. The crude oil given by the mouth undoubtedly has a good effect in leprosy, but owing to the difficulty most patients have in taking effective doses for long on account of its nauseating properties, it failed to do more than temporarily retard the progress of typically advanced cases, although Hopkins in Louisiana showed that a certain number of incipient cases might become free from outward signs of the disease. The drug thus failed to be of more than palliative value. Next atten-

tion was directed to bacterial injections but results did not prove lasting in nature. Research once more became directed to the old Indian remedy and efforts were made to find a suitable method of administering it by injection to overcome the limitation of oral methods, a case having been reported from Egypt as early as 1899 of apparent recovery after 5 years' course of such injections of a painful nature, which few patients are willing to submit to, and in 1914 Dr. Heiser in the Phillipines recorded apparent cures of 11 per cent of a small series of cases treated by this method".

To cut the narration short, it may be stated that L. Rogers at the instigation of Heiser, prepared Sod. gynocardate with the help of Chunilal Bose of Calcutta. This was used subcutaneously: injections were painful and the range of usefulness limited. Next it was ascertained through animal experiments that the drug can be administered intravenously. The intravenous injections were painless and produced local inflammatory reactions in the Leprous-nodules with rapid destruction of the causative organisms. It was further shown that not only the different hydrocarpus oils, but also cod-liver oil and soya-bean were effective in Leprosy. Now arises the question what is the active principle of all these heterogeneous groups of oils? The tentative answer is the presence of unsaturated fatty acids with lower melting point. The workers at Honolulu, Professor Dean and his colleagues, made the next advance by introducing the Ethyl Ester Chaulmoograte, a soluble product suited for intramuscular injection.

On comparing the published statistics from different centres, one is forced to the conclusion that derivatives of Chaulmoogra or Hydrocarpus retard the progress of ad-

vanced cases and cure early cases. These oils are not specific in the sense that Emetine is for amoebic dysentery, Quinine for Malaria and salicylates for Rheumatism. At present, there are three methods in extensive use:

(1) The Calcutta School of Tropical Medicine under the leadership of Dr. Muir uses a combination known as E.C.C.O., i.e., Ethyl Ester of Hydrocarpus, camphor, creosote and olive oil: Ethyl Ester of Hydrocarpus oil 1 c. c. Camphor—1 gramme. Doubly distilled creosote 1 c. c. Olive oil—2.5 c. c.

2. The Philippine workers use "Moogrol" an ethyl ester with addition of 0.5 per cent Iodine, which lessens pain at the site of injections.

Pure Hydrocarpus oil is used as subcutaneous injections in China, especially by workers in Korea.

3. Dr. E. O. Travers is using a much simpler treatment in the Federated Malaya States. The chaulmoogra nut is ground to a fine powder on a curry stone and mixed with a small spiked seed called 'Pak chut lai', and also a hemp seed known as 'Toh Mah Yan' which is steamed and ground as fine as possible. These are mixed together in the proportion of 2 parts of chaulmoogra and one part of each of the other two. Dose is $\frac{1}{2}$ to 1 drachm by mouth once daily. This method will simplify matters a good deal, and fuller report of the result is anxiously awaited.

The two seeds are indigenous to China and are readily available in the F. M. S. The addition of these two seeds are really correctives for chaulmoogra seeds in that the gastro-intestinal symptoms are controlled and the patient is enabled to take the drug by mouth for considerable periods.

The above out-lined treatment should be supple-

mented by nutritious diet rich in fat and vitamins, exercise, fresh-air, and sanitary surroundings.

Prophylaxis.—Just like what is obtained in any other infectious disease, lepers have to be segregated and this meant a life-long segregation in former days. Records will amply prove that those countries which adopted a rigid system of segregation got rid of the disease rapidly. If effective measures are to be adopted to control the spread of leprosy, and eradicate it from a place, the following points will receive attention :—

1. Successful legislation.
2. Compulsory notification.
3. Segregation.
4. Educating public opinion.
5. Early diagnosis and treatment of cases, as outpatients in special centres.
6. The latest treatment should be made available for all segregated cases.

If well-applied, the diseases should be eradicated in 10 to 15 years from any area.

I may be permitted to say a few words about the lepers in India, and the Madras Presidency in particular. According to the census return of 1921, there are 200,000 lepers in India and 15,753 in the Madras Presidency. Remembering that the enumerators are laymen and hence, a good many early cases could not have been properly returned, experts are of opinion that there are 500,000 lepers in India.

Turning to the Madras Presidency, I have just stated that there are 15,753 lepers. Of these 979 are segregated in 11 asylums established in different places, i.e., out of every 100 lepers only 6 are segregated. There are, in this presidency, 37 lepers per 100,000 of population, according to the census of 1921.

The old Indian Lepers' Act was of very little value, for, by this act, only a leper who was in the ulcerated stage of the disease could be compulsorily segregated. As soon as the ulcers healed up, while they were treated in segregation, they demanded release and were set at liberty, as they did not technically come within the meaning of a 'leper', in the Leper Act. The present amended Leper Act of 1920 is a very useful piece of legislation. According to this, any person, who is a leper, in any stage of the disease, and who is begging in public, or doing certain work, may be compulsorily segregated. But this act does not take notice of lepers from the middle and upper classes.

Segregation in India meant only Leper Asylums till a decade back. Now there are leper colonies in different places. We have one at Chingleput consisting of 540 acres, Lady Willingdon Leper Settlement. Here community life is aimed at, and settlement segregation is for those vagrant and begging lepers, and such others who are engaged in certain occupations forbidden by the Act, who are compulsorily segregated by the authorities. In a well-ordered Settlement, single males, single females, married lepers, and healthy attendants and staff are accommodated in different sections. Arrangements are made to isolate children born to lepers in the Settlement. Dispensaries are established for treating early cases: hospital accommodation is provided for advanced, mutilated and paralytic cases. Plots for gardening are laid out: crops may be raised. Recreation rooms, walks and amusements are provided. In short, everything is made attractive to enliven the days of the unfortunates. With the modern treatment the out-look is not gloomy. If a leper, after careful treatment, is bacteriologically negative for 3

years, he may be returned to the family. Advanced cases, however well they may be, cannot obtain this concession, as relapses are common.

Till now lepers in the asylums were mutilated and maimed beggars. The authorities were satisfied if they were housed, clothed and fed. The present methods may be made available and the progress of the disease stayed and their lot a good deal bettered.

Early cases may be treated as out-patients. If the patient is made to understand about the nature of his malady, and the medical attendant is quite sympathetic, there will be no trouble in securing a regular attendance. An experiment of this nature is being tried in the Skin Clinic of the out-patient Department of the General Hospital, Madras. This gives an opportunity for the students to study cases and get acquainted with the early manifestations of the disease.

Work of the Mission to Lepers in India.

An Irish Missionary, Mr. Wellesley C. Bailey, connected with the American Presbyterian Mission, in the Punjab, was mainly responsible in organizing the Mission to Lepers. This was started in 1874. Most of the work among Lepers in India to-day is done under the auspices of the Mission to Lepers. All the workers, British, Indian, American, Swiss, Danish and Canadian, are honorary as far as the leper work is concerned, receiving no salary from the Mission to Lepers for their self-sacrificing work. Theirs is a labour of love. The Indian public and the Government owe a deep debt of gratitude to these workers.

The Mission to Lepers ministers to nearly 7,500 lepers in India out of the 12,000 Lepers segregated in the different asylums or in other words, 60 per cent. are

looked after by the Mission. Some of the asylums belonging to the Mission have lands for gardening and cultivation. Latest treatment is made available and those who are declared cured are taught carpentry, needle-work, and other useful work. Most of them are willing to remain in the asylum as staff in the hospital, or servants, thus repaying the kindness they have received. Lepers are taught to read and write: religious instruction is not compulsory. Thus Mission to Lepers has proved itself a real friend to the Lepers of India.

There are no really Government Leper Asylums in India. They are all municipal, though financed liberally by Government.

Most of the Provincial Governments have schemes for providing large leper settlements or Farm Colonies for pauper and begging patients who will be compulsorily segregated.

Bengal has 700 acres bought up in Mindapore.

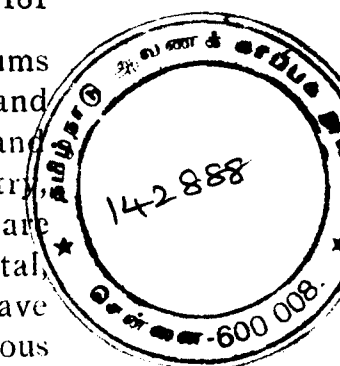
Madras has 240 acres bought up at Chengleput.

Central Province has a settlement at Raipur. Bombay has a brilliant scheme to remove the present Matunga Asylum further interior to a convenient spot where a settlement can be started.

Travancore has 2,053 Lepers. There are 3 asylums accommodating 245 lepers, ie., 11.9 lepers are segregated.

Madras spends Rs. 4-8-0 per leper per mensem while the Punjab Government spends Rs. 11-0-0 per head per mensem.

If only the settlements and asylums are worked efficiently, and the remedy brought to the level of a specific by strenuous research, India would have tackled her Leper problem and be rid of a hideous disease that is taking a high death-toll.



Editorial

We wish a very Happy New Year to all our readers, subscribers, contributors and colleagues.

Happy are we in having reached the ninth year of our existence—which is due to the willingness of contributors, the tolerance of subscribers, the encouragement of readers and the persistence and insistence of our secretaries. Our congratulations to all these for their respective qualities, and our solicitations for their continued support.

We have to announce here, that taking the advice of our Patron- Surgeon General Megaw, the magazine will hereafter be run more and more by the initiative of the Students themselves, whom we wish all success.

* * * *

It is our painful duty to record our deepest and heartfelt sorrow at the unexpected and untimely demise of the Raja of Panagal. The late Raja Ramarayinangar was one of the greatest statesmen of the present times. It is the good fortune of the medical services in Madras that the medical portfolio passed into the hands of such a strong and far sighted minister at a critical time. The policy of encouraging the provincial services which started during the regime of Sir Alexander Cardew, was given a very strong impetus by the late Raja Saheb. His personal influence and persuasive powers were so great that eminent Surgeon Generals like Major General Gifford and Major General Symons heartily concurred with him in carrying out the reforms in service. A large number of posts were created in the professorial staff and the appointments were given to the deserving. The ratio of

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Civil Surgeons in the cadre was enormously increased. During his time curative and preventive medicine were placed on a stronger basis than ever. By his initiative a new Medical College was opened at Vizag. the Medical Schools teaching allopathic medicine were reorganised, the rural medical aid was initiated and the sanitary service was reorganised—the latter so thoughtfully that epidemics of cholera became scarce. Not only did he pay such attention to allopathic medicine, but he started the Govt. School of Indian Medicine for teaching the indigenous systems of medicine, in spite of the stubborn opposition of those that could not see far enough into the future to realise that all medicine is one, that science knows no bounds of realm, race, creed or caste and that relief of suffering and prolongation of healthy life must be the motto of medicine. In this venture, which is the first in India, he had the hearty cooperation of Major General Symons, the present Director General of Indian Medical Service.

Reserved and courteous, few understood the real man. He had the courtesy of the East with the reserve of the West, the idealism of the East with the practicality of the West.

In his loss the country in general and the medical profession in particular have lost a great asset.

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We deeply regret to record the demise of B. Venkoba Rao (Third year M. B). We offer our heartfelt condolences to the bereaved family.

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It is some years since the University recommended that every constituent and affiliated college should have a common room for students. Nay, the University made it a condition of affiliation. The need for this common

room does not require any advocacy. To develop the *esprit de Corps*, to wear off the angularities, and idiosyncracies of individuals and to provoke thought and stimulate and maintain a spirit of enquiry, such a room is very essential, specially for the Medical College. May we hope that under the guiding influence of our Patron, that we may have a "Common Room" soon in our College.

May we plead again on behalf of our student population the great need for having a Hostel for Medical Students. Year after year this subject is mooted, editors write, the principals recommend, the powers that be promise a favourable consideration, but the Hostel does not materialize. In these days of epidemics of cholera and typhoid we would most earnestly press on the authorities the need for solving this difficulty. We hope by the time the year closes we might see the students happily lodged in proper hostels under careful management.

With the advent of the new year, there have been a number of changes in the Professorial Staff, Col. Hingston our popular principal has gone on leave and his place has been taken by Col. Gray M.B. F.R.C.S. (Edin). He qualified for the M.B. Ch. B in 1901, joined the I.M.S. promoted to captaincy in 1908, and has been in the civil service from 1908. Having had experience of work in G. H, Mental Hospital, Maternity Hospital, and having taught such diverse subjects as Biology, Anatomy, Ophthalmology, Midwifery, Medicine, Mental Diseases, and Medical Jurisprudence and having been a personal assistant to the S. G. for some years, we are certain the college has been very fortunate in getting him as the principal. We are sure he will give the college the benefit of his long experience and insight into teaching and administration.

In the General Hospital also there has been change in the Staff. Consequent on Col. Bradfield going on leave Col. Skinner has been appointed Superintendent and Col. Lorimer F.R.C.S. as Surgeon and Prof. of Surgery. We need not introduce the ever affable and conscientious Col. Skinner. He is courteous to a fault, and ever ready to look into both sides of the question. We are certain that the whole hospital welcomes him. Nor is there need to introduce Col. Lorimer who was till a few years ago the energetic and sympathetic R. M. O. of the G. H., whose genius for organising could have been seen by any one who visited the O. P. department in his days. We hope that his undoubted powers will be utilized by those responsible for reorganising the General Hospital.

Lastly we have to welcome Dr. Happer, the Venerial specialist into our midst. He has worked in the Social Hygiene delegation and we are glad that his knowledge and experience is being utilized for training our young students.

The new year has begun brightly for the cause of Science in Madras in as much as the Indian Science Congress met here in the Medical College premises. From far and near enthusiastic savants had come to submit their discoveries, researches, or views to the criticism approval and acceptance of the learned assembly. This year was a record year for attendance and for the number of papers presented. The papers were so numerous that it was found impossible to have a fair amount of discussion. Every one felt this and the President in winding up the proceedings promised that the Sub-committee for the next year would let in only papers of special merit and

thus secure a greater amount of time for the proper discussion of the subjects.

There were some papers of outstanding merit which were really thought provoking. We may mention the paper on Bovine Lymphangitis by Dr. Krishnamurthi (Veterinary). The array of facts brought forward about the epidemiology and parasitology of Bovine Lymphangitis and human Pestis makes one wonder whether Kala-Azar and Oriental-Sore could not be investigated on similar lines.

Similarly most of the papers from King Institute were highly suggestive, specially those dealing with Filariasis.

The epidemiology of Malaria was an interesting but incomplete paper.

The French treatment of Tuberculosis deserves to be tested.

The paper on Superficial Punctate Keratitis deserves special mention and we hope the authors will continue the investigations further.

Lastly we feel it our duty to congratulate Major. K. G. Pandalai, F.R.C.S., I.M.S., and Mr. A. F. MacCulloch, M.A. B.S.C., F.I.C., the local secretaries for the thoroughness with which they organised the whole show and made it such a splendid success.

Hypersensitiveness

BY NARASIMHA RAO, FOURTH M.B.

The phenomena of Hypersensitiveness manifests itself when individuals who are susceptible to foreign proteins develop certain symptoms, such as, Paroxysmal Rhinorrhœa, Hay fever, Asthma and similar anaphylactic conditions, when brought into contact with the particular substance. Various names have been suggested from time to time, for Hypersensitiveness as "Allergy" by Pirquet and "Alopy" by Coca. The term "Anaphylaxis" applies only to a particular antigen-antibody reaction that is artificially produced in laboratory animals.

The study of this particular phenomena dates from 1839. Majendee has observed in that year that rabbits which had received two intravenous injections of egg-white might succumb suddenly as a result of the third. Again in 1875 Blackey who was suffering from Hay fever for a long time, accidentally discovered that the hay fever was aggravated when his daughter placed a vase of grasses in his room. He worked out that it was due to the pollen which when rubbed on his skin produced urticaria and when applied to his nose produced immediate sneezing for some time. Theobald Smith in America, in 1905 conducted researches on Anaphylaxis and threw a flood of light over a new field in Immunology. Recent investigations on the subject were conducted by Walkar, Cooke, Vander Veer, and Goodle, who contributed much to the advancement of science in this aspect and offered a scientific explanation to the diseases garbed under the name of neurosis, susceptibility, and Neuropathic diathesis.

Anaphylaxis in General

We would expect that the protective reactions induced by an antigen in immunization would be reinforced on the re-introduction of the antigen normally; but it is not always the case. Peculiar violent and even fatal symptoms may set in when the antigen is reintroduced; and this phase of immunization has been designated as Anaphylaxis, (an opposite of prophylaxis), Hypersensitiveness and Protein sensitization. This Anaphylaxis manifests itself as local or general phenomena. The local reaction that appears at the seat of injection such as Necrosis, Oedema, and Urticaria, go by the name of Arthus-phenomena. The various general symptoms that are produced such as restlessness, hyperalgesia followed by collapse, marked fall of temperature and blood pressure, passage of urine and faeces, depressed heart action, and dyspnoea, and respiratory paralytic symptoms go by the name of Theobald-Smith phenomena. The post mortem appearances and the symptoms are typical, and are characteristic for each species, depending upon the intensity of the reaction; but they are all essentially inter-related. The experimental production of Anaphylaxis in laboratory animals has revealed that the cardinal features of Anaphylaxis are as follows:—

- i. Any antigen will cause it. eg. egg-white serum, toxins, etc.
- ii. The sensitizing (i.e. the first injection of the protein) and the toxogenic doses (i.e. the second injection which produces this phenomena) must be the same kind of antigen.
- iii. The first injection may be of any quantity of the antigen, and the second injection should

always be many times the sensitizing dose and should be given after 10 to 14 days.

- iv. The site of the injection is not important. It may be subcutaneous, intra-venous or intramuscular.
- v. When once reaction occurs the animal is desensitized; as also sensitization once induced may exist for many years.
- vi. It may be prevented by giving atropine and adrenaline, and desensitization can be affected by giving the toxogenic dose in small quantities. No Anaphylaxis occurs with a second dose of antigen if given within ten days.

It may not be out of place here to mention the theories of Anaphylaxis. Whilst it is now admitted by all that Anaphylaxis depends upon the interaction of antigen and anti-substance (Anaphylactogen or Anaphylactin) there has been much diversity of opinion as to the site and mode of occurrence. Two theories have been advanced. According to the one advocated by Dale the whole reaction takes place in the tissue cells, which attract the antigen in a concentrated form and thus produce the disturbance; while according to the other, advocated by Freidberger, the reaction takes in the blood, with the production of a poison, (Apotoxin or the Anaphylotoxin.) Recent investigations by Mille. P. Mendelev on the mechanism of shock, by electrometric methods, revealed that during antigen-antibody reaction, there is an increase of "H ion" concentration of the blood, which remain free after the play of the Buffer's of the body. Both in the protein shock as well as Anaphylactic shock the essential causes of the crises are identical. There is a sudden rupture of the colloidal equilibrium of the blood

and consequent liberation of "H ions" which produce the same symptoms.

Allergy in Man.

From the allergic manifestation exhibited in man, there is no gainsaying that human diseases present a rich field for the study of Allergic phenomena. It may be produced by either foreign proteins or bacteria.

A. In the former we have two varieties:

- i. One is the apparently spontaneous reaction often intense and obscure in origin giving a history of familial tendencies such as Hay fever, Food idiosyncracies and Sensitization phenomena as exhibited in generalised horse Asthma.
- ii. The serum disease appears in man in the form of urticaria with slight fever, and enlargements of superficial lymph nodes associated with itching, either immediately after injection of serum or after some incubation period. Sometimes it is developed after blood transfusion.

B. The Allergy in infectious diseases can be divided into four sub-heads:---

- (i) In many infectious diseases certain symptoms and lesions may be explained as allergic in origin such as the eruptive changes that take place in the skin. In Typhoid the maculæ appear only after the antibody is developed in the blood and the antigen antibody reaction is manifest as eruptive changes of the skin.
- (ii) In certain forms of Asthma the main sensitizing agent is a particular protein developed by the Bacteria, which infest the nose, throat, lungs and

intestine. As a result of this the colloidal equilibrium is disturbed producing Asthmatic seizer.

- (iii) Specific reaction in local and general infections, eg.—Tuberculin reactions generally used to diagnose the tubercular patients. Skin reactions in glanders Streptococcus, Gonococcus infections, are some forms of Dermatitis: in the former and simple erythema or urticaria or hæmorrhagic Bullous eruptions or Hyperkeratosis that occur in the latter.
- (iv) Early reaction which follows after protective inoculation against smallpox Typhoid may also be explained as an Allergic manifestation.

The clinical symptoms of Anaphylaxis in man are Asthma, Hay fever, Eczema, Urticaria, Angio-Neurotic œdema, Epilepsy, Migraine, and Mucous Collitis of Hurst.

Actiology of Hyper-sensitiveness

It is still a moot point why some people are Hyper-sensitive while some others are perfectly normal and do not react at all. A discussion of the causes of Hyper-sensitiveness (without an adequate explanation of the above) is only possible. Why one should be Hyper-sensitive and the other not stands much the same argument why one should be Brainy and the other not. Thus we see each individual is different from his neighbour. Each has been prophylactised or anaphylactised to different degrees against different substances. Each is himself and not another. Each has his idiosyncracies or to put it better his humoral individuality as well as his psychological individuality are the factors to differentiate him.

The other factors in Hyper-sensitiveness are:—

- (i) *Age*.—Age is no criterion. A man may develop

- Asthma or Hay fever at any age but generally starts in childhood or in young adult life.
- (ii) *Constitution*—of the individual varies in all Hypersensitiveness and there is no common bond.
 - (iii) *Disfunction of glands*. This is not a factor at all since the clinical manifestations of allergy occur both in Hyper as well as Hypo functions of the endocrines. Supra-renal deficiency as suggested by the prompt response of Asthma to epinephrin is at least not accompanied by the low blood pressure and the inanition so characteristic of Addison's disease. The various endocrine types of men have no relation to Hypersensitiveness and to it all are equal.
 - (iv) Hypersensitiveness is not only hereditary (though it is refuted by some to be hereditary) but also acquired as exhibited in industrial type of Asthma occurring in factory workers. Cooke and Vander Veer have shown that Hypersensitiveness as manifested in Asthma, Hay fever and some form of Dermatitis is inherited according to the Mendelian Law and they have found evidences of Hypersensitiveness in about 50 per cent of cases. But on the whole we can't exclude the possibility of acquired character becoming hereditary.
 - (v) *Mechanism of sensitisation*. It is quite unknown. It is easy to sensitize animals by the respiratory as well as gastro-intestinal tract and most of the manifestations in man are due to the sensitisation through the alimentary tract or the respiratory tract either of which may

- exhibit the same symptoms. The development of human Hypersensitiveness is the result of slow and gradual process of sensitisation. The theories that Asthma and Hay fever are the results of a Toxæmia (emphatically advocated by James Adam and others) is not far off from the sensitisation produced by the particular protein absorbed from the intestine whether it be of bacterial origin or otherwise.
- (vi) Generally Hypersensitiveness to foods is common in children and hypersensitiveness to inhalation are more common in adults though there is no such hard and fast rule. Egg white or cow-milk produces Asthma in the child; pollen or some other inhalation produces Asthma or Hay fever in the adult.
 - (vii) Hypersensitiveness by direct contact; eg. Skin reaction, Eczema due to contact with the irritant.
 - (viii) Subcutaneous inoculation is only of theoretical interest. Attacks of Asthma, Urticaria, Angio-Neurotic oedema and vaso Motor spasm may be easily produced by over doses of rag-weed, pollen, horse dandruff, cat-hair extract to which the patient is Hypersensitive.

Diagnosis of Hypersensitiveness.

In some cases it is very easy to guess from the history and in others it is extraordinarily difficult. Thus history of the patient's illness and especially the onset of the first attack is important. In many cases, the patient is aware of his own Hypersensitiveness. He knows that eggs or fish is poisonous to him and he learns to avoid

them. In Hay fever the particular protein whether from trees, grasses or rag-weed can be identified by history alone. In addition the patient also gives a history of spastic constipation, mucous colitis, head-colds, migraine, epilepsy etc.

Skin tests.—especially advocated by Walkar. By the reaction of the skin to the various proteins we can easily determine the causative antigen. It can be done by scarification or intra-Dermal method using the Park Davis preparation of the various proteins.

Conjunctival tests.—are entirely analogous to the skin tests but are more delicate. By putting a drop or two of the antigen in great dilution into the conjunctival sac, if the patient is sensitive, we find his conjunctiva red, injected and itchy, within a few minutes. The reaction can be controlled by a drop of Adrenaline Chloride (1 in 10,000). This test can also be used to find out the degree of sensitiveness.

A careful examination of any septic foci and bacterial infection must be made. Culture of stool for Streptococci or other organisms, culture of sputum and the identification of the organisms should be made.

Lastly Eosinophilia is a marked feature in this phenomenon even up to 90. Perhaps the eosinophil cells are attracted by the acid condition of the blood or it may be a positive chemotaxis to the proteins. Eosinophilia is of diagnostic importance.

Treatment

The treatment of Hypersensitiveness is best accomplished by preventing contact with the offending agent. "The pedlar with horse Asthma who buys a motor car after the death of his horse is at once relieved of his trouble. The girl who gives up her face powder stops sneezing."

Desensitization may be affected by injecting extract of the offending agent in graduated doses, when the symptoms depend upon a substance exposure to which cannot be avoided eg. eggwhite, pollen, bacteria. Desensitization reaction is specific in that good results are obtained only in case the extract of the particular substance causing the symptoms is used. Hence the need of the autogenous vaccines in Bacterial infections.

Arsenic is extensively used in organic form to desensitize the vagus centre since it is found to be irritable in all these conditions producing vagotonia. The administration of alkalies in most of these conditions of Anaphylaxis seems to be quite attuned to the Biochemical changes taking place in the Blood with the production of excess of "H ions."

I am much indebted to Capt. P. N. Basu I.M.S., for his invaluable suggestions and encouragement.

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Quinine in the Treatment of Lobar Pneumonia

BY R. SUNDARAM IYER, IV M.B., B.S., CLASS.

W. Berger reports favourably on the treatment of Lobar Pneumonia by intravenous injections of Quinine Hydrochloride in doses of 7-10 grains. Our readers might at first sight find it difficult to imagine the favourable effects of quinine (a general protoplasmic poison) in pneumonia wherein part of our routine treatment consists in inducing leucocytosis. Quinine preparations in general have a pneumococcal action in vitro. Perhaps in the blood also quinine acts as a direct poison to the bacteria or as in Malaria helps the natural phagocytes of the blood to fight the invader successfully or by a process of detoxication relieves the profound toxæmia which is by far the commonest cause of death in pneumonia.

It is claimed by the exponent of this method of treatment that quinine either aborts the disease or definitely shortens its course. Further the beneficial effects of quinine were shown by a transient or prolonged improvement of the general condition, a marked relief of the subjective symptoms and by the absence of serious complications such as nephritis, pericarditis, and jaundice. At the same time he urges that the success of the treatment depends largely on its early commencement.

May I request the Editor and such of our learned readers to give their considered opinion on the above line of treatment in the interests of students and practitioners.

Case Reports

A case of Renal Calculus in the Second Surgeon's Wards

Mr. S. W. aged 40 was admitted into the second Surgeon's wards on 23-11-28 with the following history: (Patient's own words). "Pain in the right side of the abdomen for about 15 to 20 years: Pain in the loins which he always mistook for "stomachache" or "colic" and used to try both "Native" and "English" treatment. Purgatives used to give some relief for a few days at least. The first suspicion of the real nature of the disease came only in 1921 when there was an attack of "Renal colic" lasting 3 days—the most excruciating pain shooting down to the testicle and the side of the thighs and lasting for a few hours. It was in 1921 that, for the first time the pain shifted to the left side and it was an acute attack. When the pains began, there was very severe vomiting. During one such paroxysm of vomiting the jaw-bone was dislocated (in 1921) (and at this point the patient says more attention was paid to setting the jaw back rather than attacking the kidney condition.) At the end of these 3 days, in 4 or 5 very painful urinations patient passed about a handful of stones each about the size of a pea. Patient was passing "urinary sand" for about 5 years before this attack. Some of the stones passed were even of the size of a coffee-seed, round and of a dark red colour. After passing these stones patient was relieved of his symptoms and therefore sought no further treatment. Since that time this pain has been occurring almost daily on the left side especially in the afternoons and after midnight.

The present attack came on suddenly 3 months ago.

Before this attack the usual pains had stopped completely for about 6 months, and patient was of opinion that he was free from the disease. One morning the attack came on suddenly. Hot water bottle was applied: gave relief for 2 or 3 hours, then the pain reappeared. Then for about 15 days the pain used to recur with few intervals of relief lasting 8 or 9 hours at a stretch. The patient used to writhe in agony and perspire. Sitting in hot-water, hot-water-fomentations, hot-water bag all these failed to give relief. And patient had to resort to morphia injections for relief. During the acute attacks patient never used to micturate and his bladder was empty (calculus anuria?)

Some doctors examined him and an X-ray was taken at Ernakulam. 6 stones were found in both kidneys and the medical officer advised going to Madras and getting himself operated. Patient got afraid and resorted to native treatment. After 2 or 3 days considerable relief was obtained as regards the pain. Still the pain did not disappear altogether and used to come on once a week or so and patient had to resort to morphia again. Vomiting and indigestion also set in. At last patient resolved to come to Madras for treatment.

On Admission

Pain in the left side of abdomen a little outside the umbilicus coming on irregularly with no definite relation to food. Lasts about 5 or 6 hours. Two months back used to vomit bilious matter about 3 or 4 hours after meals. Appetite slightly impaired. Bowels irregular; deep tenderness in the left kidney region. Stones could be felt in the right kidney.

Heart & Lung—Nil abnormal

Skiagram—Stones in both kidneys

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Blood pressure—Syst. 145. Diast. 110.
Urine on 29-11-28—S.G.-1006.

Reaction—alkaline.

Albumen—+ (Positive).

Sugar—Nil.

Acetone—Nil.

Deposit—Oxalate & phosphate crystals.

1-12-28 Blood-urea-82 mgms. per 100 c.c.

28-11-28 *Nephrolithotomy* operation was done under general anaesthesia. The operation notes read, left lumbar incision; the muscular and fascial layers divided. Thick kidney with fatty adherent capsule; large soft kidney about 5x3". Pelvis contained 8 stones. Calyces dilated, a cyst present on the convex border of the kidney. Early Hydronephrosis? Two drainage tubes placed in the pelvis of the kidney. The ureter catheterised up to bladder. Abdominal wall closed in layers.

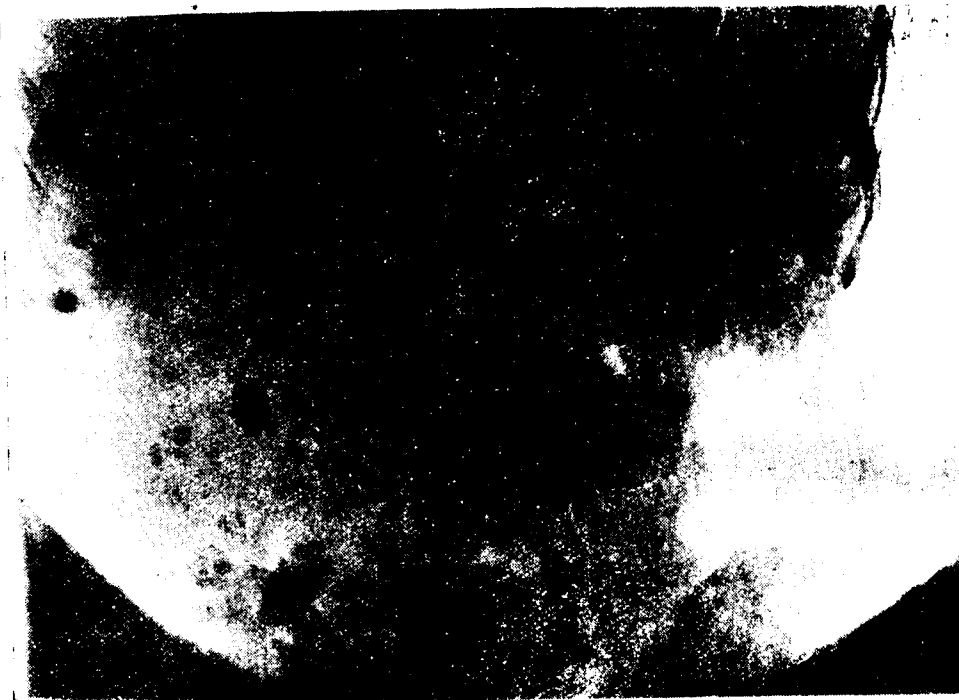
7-12-28. Upper drainage tube removed.

10-12-28 Lower drainage tube removed. Sutures removed.

15-12-28. A stone from the bladder passed into the urethra blocking up the urine and causing severe pain. *Not passed any urine* since 1 p.m. Bladder distended up to $\frac{1}{2}$ " above the symphysis pubis. A soap and water enema at 5-30 p.m. was given and a stone about the size of a coffee seed, pyramidal in shape and faceted was passed with urine.

16-12-28. Blood-urea—212 mgms per 100.c.c.

The interesting points in this case are the relative freedom from symptoms in spite of the large number of stones in both the kidneys for so many years; the kidneys functioning normally as will be seen by the Blood-urea and the remarkably large size of stones that the patient was passing per urethra.



Skiagram showing several Calculi in both Kidneys. Left Kidney slightly enlarged.
Right Kidney enlarged and displaced downwards.



Skiagram, after removal of Calculi from the Left Kidney.
The Right Kidney still contains the Calculi.

28-12-28. Since writing the above the patient was running a hectic temperature for 10 days and losing ground gradually. There was severe pain in the right loin and infection of the right kidney was suspected. Patient was therefore operated on 28-12-28 and the operation notes are as follows :—

Right *Nephrectomy*, oblique lumbar route : adhesions not numerous; kidney easily delivered. On incising the specimen creamy pus with several stones escaped. *Pyonephrosis due to renal calculi*.

Another interesting point has also come to light. Patient's brother has also been complaining of similar symptoms and on X-ray examination his right kidney has been found to contain two stones.

* * * *

A Case of Vesical Calculus From the Second Surgeon's Wards

K. M. Mohammadan, aged 40 came in with a complaint of frequency of micturition of duration 3 years. On interrogation, the patient gave a history of having had Gonorrhoea about 15 years ago but now the complaint for which he sought treatment was frequency of micturition and pain in the loins a dull constant pain present always and not particularly increased during micturition or in any way influenced by rest or exertion.

On *Rectal Examination*, an enlarged and rather painful prostate was detected.

On passing a metal catheter into the bladder, the characteristic grating was felt by the catheter striking against a stone.

On *X-ray Examination*, a large shadow about the size of a small orange was seen in the bladder as also a

Case Reports

smaller calculus in the prostate about the size of a small marble (Vide X-ray reproduced).

The X-ray having confirmed the diagnosis of vesical calculus, it was decided to remove it by the supra-pubic route taking into consideration the size of the calculus. Supra-pubic lithotomy was done and the operation notes read as follows. A large stone about the size of an egg was removed; in the prostatic urethra there was a small stone which could be felt by the finger introduced from the internal meatus. A sound was passed from the urethra and the stone was probably pushed into the bladder, but was not seen. A large sized drainage tube was put into the bladder, and the bladder closed round it tightly with catgut. The prevesical space was drained by a small tube and the parietal wound closed. The prostate was only slightly enlarged and there was no projection into the bladder.

Post operative Treatment :

16-11-28. Patient put on Hexamine mixture and Boric bladder-wash daily.

23-11-28. Supra-pubic tube removed.

24-11-28. pt. has hiccough. Slight Sepsis in the supra pubic wound.

25-11-28. Hiccough persisted. Stomach washed out with Sodabicarb, and patient put on calomel grs 1-2 every quarter of an hour.

On this day, an examination of the urine showed

Albumen +
Pus cells.
Epithelial cells
Few R.B. Cs
No acetone
No Sugar
No casts.

26-II-28. Hiccough continued. The blood was sent for Blood urea estimation and was found to be 119.56 mgms per 100c.c. of blood, and the hiccough was thus put down to the patient's uræmic condition and the uraemia accounted for by a probable pyelonephritis.

29-II-28. Dry cupping to both loins.

The patient's condition gradually improved and is now (16-12-28) well on the road to recovery, the supra-pubic wound having nearly closed and the patient passing urine *per vias naturales*.

It is interesting to compare the blood-urea estimation done before the operation (14-II-28) with that done on 26th.

14-II-1928—Blood urea = 44.59 mgms. per 100c.c.

26-II-1928—Blood urea = 119.56 mgms. per 100c.c.

The urea concentration test done on 14-II-1928 was as follows:

	Quantity of urine	urea
Before Test	200 c. c.	0.696
1st hour after test	70 c. c.	0.882
2nd hour after test	90 c. c.	0.945

It is also interesting to note that the patient was practically free from discomfort for the past three years with such a large sized stone in his bladder. The smoothness of the stone and the age of the patient account for this. In a younger individual with a more sensitive mucous membrane or with a rougher surfaced stone the symptoms would have been more marked and severe.

I am indebted to MAJOR PANDALAI F.R.C.S., I.M.S., for kindly permitting me to report these cases.

L. SESHADRINATHAN

House Surgeon, Second Surgeon's Wards.

A Case of Foreign Body Throat

A boy Abdul Majid aged 6 from Guntur was admitted into the E. N. T. Surgeon's wards on 13-8-28.

History.—About 2 months back, the child while playing with a small safety pin happened to swallow it. He was immediately given some castor oil by his parents, and the pin not appearing in the motions, the child was taken to Guntur Hospital. Some attempt was made to take out the pin. The child was temporarily relieved, although the pin was not removed. After some days he began to show signs of difficulty in breathing and talking.

Condition on admission.—The child was having severe dyspnoea, with harsh breathing, and could hardly talk. He did not complain of pain on swallowing, and could take the ordinary diet as usual. There was a very foul odour from the mouth.

From the history and symptoms it was almost certain that the pin was still somewhere in the respiratory passages. An X-ray of the throat and chest was taken, and the pin was seen opened up, the point of the pin turned upwards, at the level of the 4th, 5th and 6th cervical vertebrae.

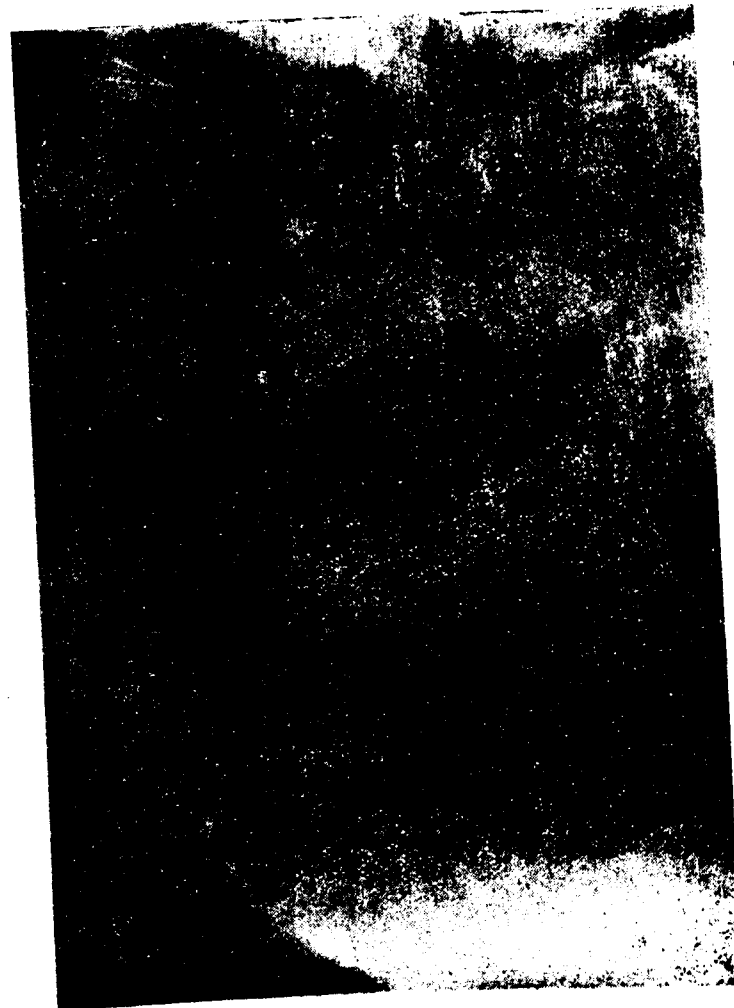
Treatment.—Child was put under chloroform, *directoscopy* was done and the pin was located in the larynx, caught between the two vocal cords. It was removed with the point up, fearing attempts to turn it might break it. The child was much relieved, and was discharged from the Hospital the same day.

My grateful thanks are due to Dr. Cherian for permission to report this case.

P.J. JOSEPH, M.B. B.S.
House Surgeon E. N. T. Dept.



Skiagram showing the pin in the respiratory passage.



Skiagram showing a large Vesical Calculus and a smaller one in the Prostatic Urethra.

A Case of Subacute Combined Degeneration

The close association of pernicious anaemia and subacute combined degeneration is now agreed to be due to the same gastro-intestinal toxin exerting its haemolytic and neurotoxic effects on the blood and the nervous tissue respectively and causing extreme anaemia on the one hand and degeneration of posterior and lateral columns of the spinal cord on the other.

The following case is a very interesting example of the close relationship that exists between the two diseases.

The patient, Mr. S., Hindu, aged 45, was admitted into the hospital on 8-11-28, complaining of loss of power in the lower extremities for the last two years.

The patient had been in the General Hospital for Pernicious anaemia, 2 ½ years ago. A few days after he left the hospital he began to experience a sense of numbness and heaviness in the legs, gradually progressing to the present condition.

On admission, he was fairly well nourished, slightly anaemic; tongue slightly coated; teeth dirty and pyorrhoea alveolaris present. He had a poor appetite and his bowels were constipated:—Blood examination showed anisocytosis and an R. B. C. count of 3,270,000 with haemoglobin—80, gave a colour index of 1.2.—Wassermann Reaction was negative.

A test meal was done with the following result.

Before testmeal: gastric contents alkaline to phenolphthalin.

After test meal: Free HCl—nil

Total acidity—0.007 grs. HCl.

Organic acid—nil.

Nervous System :—

Cranial nerves :—all normal.

Motor :—Loss of power of lower limbs; Lower limbs rigid; no wasting of muscles; Ataxy of the lower limbs very marked: Slight inco-ordination of the upper limbs also, as revealed by the finger-nose-finger test. Very slight nystagmus present; Speech is unaltered: No intention tremor.

Sensory :—Subjective sensation of tingling and numbness in his hands and legs.—Sense of light touch diminished in the left leg: But the temperature sense shows no change. Appreciation of position, passive movement, vibration and muscular sense, is defective in the lower limbs. Romberg's sign is present to a slight degree. Kinaesthetic sense in the upper limb is normal.

Reflexes :—Pupillary reflexes are normal: Abdominal reflex also is normal: Plantar response is extensor (Babinski) and the deep reflexes are all exaggerated and the ankle jerk goes into a clonus: Organic reflexes normal:

Gait :—is typically spastic ataxic in character.

Differential Diagnosis :—The spastic ataxy being the characteristic symptom of the case, the following conditions which produce this symptom have to be considered before arriving at the diagnosis of subacute combined degeneration.

(1) *Disseminated Sclerosis* : But against it are,

- (a) Age of the patient.
- (b) The presence of peripheral numbness.
- (c) The absence of intention tremor.

(2) *Myelitis or Spinal tumour* : Against these are

- (a) Insidious onset?
- (b) Absence of sharp line of sensory loss.
- (c) History of pernicious anaemia.

(3) *Tabes dorsalis*. With diffuse sclerosis or pyramidal degeneration :—But against this are

- (a) The absence of A.R. pupils
- (b) Absence of positive Wassermann reaction.

The following diseases have sometimes to be differentiated:—

- (4) *Hereditary ataxy*: But this group of diseases
 - (a) Occur during childhood or early adult life.
 - (b) Intention tremors are present.
 - (c) There is usually an absence of sensory disturbance and
 - (d) No anaemia is associated with it.
- (5) *Primary Lateral Sclerosis*: But against it are
 - (a) The absence of involvement of posterior columns and
 - (b) The characteristic blood picture of pernicious anaemia.

I have to thank Col. Malcomson for kindly permitting me to publish the notes of this case.

S. N. GANAPATHISUNDARAM

Final Year M. B.

* * *

The following cases of the III Surgéon, General Hospital are reported with his kind permission.

A Case of what appeared to be diffuse Lipoma of Scalp

Mr. A. aged 22 years, H. M. was admitted on 15-9-28 for a tumour about the size of a walnut of 8 years duration in the scalp just behind and below the right mastoid. The patient came in because he had pain of late especially on moving the neck. The tumour was growing in size very slowly. It had a lobulated feel, adherent to the skin in some areas, fluctuant, slightly movable over the deep structures of the scalp. No history of trauma or abscess

formation or any other trouble in the area. There was no pulsation, expansile or otherwise, no impulse on cough. Pressure caused no change in the size. On auscultation no bruit was heard. On shaving the scalp, a somewhat greater area, than what was apparent at first, was found to be involved in the tumour. The most probable diagnosis was diffuse lipoma of the scalp.

On cutting down over the tumour a blackish mass in connection with the posterior edge of the sterno-mastoid and splenius capitis with inflammatory adhesion around presented itself. It was then suspected to be a case of diffuse traumatic aneurysm of an artery in the area, and on incising the sac, blood clot and blood was removed. The sterno-mastoid was separated from the mastoid and the occipital artery was found bleeding into the sac. On trying to control the bleeding locally the artery gave way wherever it was clamped. Local pressure against the mastoid controlled the bleeding, and an incision anterior to the sternomastoid was made. The upper part of the wound here also showed a blackish staining, suggesting an extension of the aneurysm forward. The External Carotid artery was isolated and ligatured. The aneurysmal cavity was plugged with gauze and the wound closed. The wound healed and the patient was discharged cured 3 weeks later.

Pathological report of the blackish mass—Organising granulomatous tissue.

The probable thing in this case is, a focus of breaking down tuberculous gland near occipital artery caused a weakening of the arterial wall resulting in its aneurysmal dilatation. This gave rise to gradual bleeding, leading to a blackish stained tumour mass.

In this case since pressure on the mastoid controlled the bleeding one was able to tie the External Carotid with

the confidence of permanently controlling the bleeding. If it did not, one may have to think of bleeding in connexion with the vertebral artery. Even supposing pressure on the 'Chassignac's Tubercle' controlled the bleeding, it need not necessarily mean ligature of the common carotid will permanently stop the bleeding. Pressure on the Chassignac's tubercle, while it presses on the common carotid, may also cause a certain amount of pressure on the vertebral artery just behind, and thereby bleeding from vertebral artery also may be controlled. The surest way then is to isolate the common carotid in its middle, put a temporary ligature and pull on it. If bleeding does not stop, it is no use tying the common carotid. The vertebral artery must be isolated and ligatured.

* * * *

A chronic Guinea-worm abscess of the abdominal wall

P. aged 10 years H. M. was admitted with a tumour of the size of an orange of 9 months duration, in the anterior abdominal wall in the left hypochondriac region. The skin was freely movable over it. It was distinctly circumscribed, lobulated, not quite cystic but soft. It did not move with respiration, had no resonance in front, had no connection with the spleen, iliac bone, spine or ribs. It was fixed to the external oblique fascia. It could not be reduced into abdomen, patient had no interference with micturition or defaecation and general health was good. He had occasional attacks of fever, but had none while in hospital and the fever was thought to be due to an independent cause. The most probable diagnosis was a myxo-sarcoma from the external oblique fascia,

On opening, it turned out to be a chronic abscess between the external and internal oblique muscles, containing 10 ounces of pus. Bits of a dead worm probably guinea-worm came out. The cavity was plugged with iodoform gauze and closed.

Pathological report:—Guinea-worm. The tumour therefore turned out to be a chronic guinea-worm abscess in a rather unusual situation.

R. MAHADEVAN

Asst. to III Surgeon General Hospital Madras.

In Lighter Vein

Exams.

A friend of mine was telling me—
A ploughed medical chap is he
"I started reading when I was three,
The end I don't know when it 'll be!"

Was it not Jesus Christ who said :
"Judge not, lest thou be judged" ; instead
Our learned professors pester us
With questions, and kick up a fuss

They ask us how the world began ;
They never speak like man to man.
How clouds are formed and why the sun is hot ?
But who can answer, I demand, such rot ?

The nerve supply of so and so,
Where all the human blood does flow,
How bones are formed and tendons too—
Such funny thoughts we must poo-poo;

How does a fatty liver look ?
You never find it in a book
Where does the strepto-coccus breed ?
What funny questions these indeed !

Why does a beauteous damsel squint ;
Can you remove a corneal dint ?
What makes you see double when drunk ?
Speak up, my man, and don't you funk !

How will you feed a baby new ;
What drugs to quieten down a beau ?
Now for a broken tooth pick up the splint,
Come next October take the hint ?

—Inaugural

O! These doctors !

"O! These Doctors! How they get on my nerves!" I heard a fellow bus-passenger exclaim the other day. It was evident he was a layman and not a blooming Medico. If he weren't, he wouldn't have exclaimed so. But, to me who was just en-route to the *viva voce* that exclamation reflected but a tiny fraction of my own feelings. O Lord how these doctors get on my nerves! (My apologies to them !)

There is one thing that worries me—and that is this—when I was yet in my mother's womb a doctor examined me in spite of my protesting kicks, which he either didn't mind or was immune from. I bet he received umpteen kicks from umpteen other kids—thus the immunity ! He would not mind them—those kicks—would he, when every kick meant a live baby and every live baby meant big fees, besides a name with a capital N ?

Well, even when I had not made my appearance into this world of ours, a doctor examined me. And alas ! he didn't stop at that. He continued his exams. even after my advent into Terra Firma. And yet, he doesn't seem to feel tired even though he has been examining me now for nearly a quarter of a century ! Just fancy ! And I have my mother to blame for letting him continue his attentions on me. Even then, when I was yet a kid, these doctors used to get on my nerves. I still very well re-

member being taken one fine morning to the inevitable doctor, when he caught hold of my hands, pinched my cheeks, hit my back and front, dug deep into my tummy, and what else did he do? He did the grave offence of asking me to put my tongue out! Would I? No! certainly I wouldn't, when that would mean showing the nice red colour that my tongue had acquired by eating coloured sweets. And, wouldn't the detection of this mean a good wallop from my dad, not to mention the unpleasant aftermath to this—of having to take Castor Oil “by Doctor's orders”? O God! was this Doctor a supreme being that his words must be obeyed to the letter, thought I. Well, anyway, Might was Right then. (I'm afraid it is so even now!) My mouth was forced open, the red colour detected and the inevitable prescription prescribed! And my! didn't I give them the time of their lives! How I ran and ran, and ran, till alas! might was right! Two mighty beggars caught me, and a third one—I think it's an elder brother of mine—forced my mouth open, and presto! in went the nauseous stuff! But I wasn't to be beaten so easily; most of it came back the way it went! But the tiny bit that was inside did its nasty work all right. O! these Doctors!

But I was luckier than others. I was bothered by these doctors less frequently than my play-mates were.

But, Good Lord! Even at School these Doctors haunted me! One chap comes and writes something in a slip of paper and asks me to take it to my dad. I take it to my dad, and he takes me to another doctor the next day. But this time in the Eye Hospital. There they put some greasy stuff at the end of a stick into my eyes, and O! what a shame! one blighter made me read the letters of the alphabet, all in a jumble, forgetting that I could repeat the Third Reader by heart! The next week found

me the proud possessor of a pair of spectacles. But I wasn't very happy with these, as these were the object of ridicule, and many a fellow, I daresay, remembers to this very day the black-eye he got once for calling me “four eyes”, though my dad swore at me those evenings and on the morrow I had a new pair of glasses!

I was very lucky indeed the major part of my High School course. I was a fairly healthy chap and never gave as much as half a chance to these doctors! Serve them right—what!

But alas! it wasn't to be for long. Now began a regular examination by doctors and a long series of them! Every seventh lecture exams! Every three months, every six months, every year! Exams, exams, exams, O Lord! what a grind!

One chap comes to me and asks me why the trains run or why the fire is hot? (How silly!) As if nobody knows without being examined that trains run because passengers have to be carried, and the fire is hot because it has to cook our food, what! As if why trains run or how the motor works or when it will rain is going to help a fellow to prescribe a pill or a draught!

And then comes the most extraordinary experience of my life. In my High School and Arts Course exams were written all written! But now, a new stunt is the rage. An Oral! O Lord! how nervous I was in the beginning! There was a chap whose size and appearance frightened me but I was mistaken—his words were kind and his action kinder he gave me my M. B. that year. Alas! he is no more now. R. I. P.

But as I said just a while ago, I was far luckier than my comrades. I didn't give these doctors more than one chance a year, but they want to have vengeance on me evidently, for just when I want to leave them for ever,

they want to make it absolutely hot for me, and examine me again, and again, and again! O! These Doctors!

And so long as "life is but an M. B.,-dream", I must with Johnnie Walker, subscribe myself,

--Still going strong

University of Madras

Medical Examination Results October 1928

[Note.—Names in italics denote female candidates.]

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Third M. B. & B. S.

SECOND CLASS.

Medical College, Madras.

(Whole Examination.)

Rank.	Reg. No.		Rank	Reg. No.
1	32	Narayanaswami Ayyar, A.	4	33 Natesan, N.
2	27	Johnson, A. S.	5	44 Venkatarangam, M. P.
3	34	Natesan, P.		

(Materia Medica only.)

21 Balasubrahmanyam, V.

Final M. B. & B. S.

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PART I.

52 Itty, Sarah P.

56 Padma, A. S.

PART II.

SECOND CLASS

1	125	Srinivasan, V.	85	Krishnayya, Adur.
2	81	Koshi, Rebecca.	100	Rajagopalan, V.
3	108	Sambandam, K.	109	Satur, Dorothy M.
4	95	Narayanamurti, K.	117	Seshadrinathan, N.
	69	deLemos, N. J. C.	118	Seshagiri Rao, S.
	73	Eapen, J. J.	120	Sivasankara Pillai, S.
	78	Kalyani Amma, M.	128	Subbaramayya, B.
	79	Kamalanma, B.	140	Venkataramayya, Y.
	83	Krishnaswami, S. V.		

Third L. M. & S.

(Whole Examination.)

22 Chathu Achan V. N.

(Materia Medica only.)

26 Jacob, C.

Final L. M. & S.

PART I.

*45 Arul, E. J. A.

*54 Madhava Menon, K. V.

*60 Subrahmanyam, V.

* Obtained passing marks for the Part I of the Final M. B. & B. S. Examination.

PART II.

Subjects in which exemption
is now obtained for M. B.
Medicine and Midwifery.

70 de Rozario, C. F.	Medicine.
87 Manavikraman Thampan, K.	Do.
90 Mathai, Elachi,	Medicine.
92 Narasimhamurti B.	Do.
113 Savarirayan, J. C.	Medicine.
122 Somasundaram, S.	Surgery.
137 Velayudham, P. A.	Medicine.
138 Venkatachalam, A. S.	Do.

The following candidates who appeared for the various examinations for M. B. & B. S. Degree have qualified for a pass in the corresponding examination for the L. M. & S. Degree:—

Third L. M. & S.

(Whole Examination.)

Register number and name of candidate.
41 Subrahmanyam, N.

Final L. M. & S.

PART I:

Subjects in which exemption
is obtained for M. B.
Jurisprudence.

55 Muhammad Abul Hadi

PART II.

65 Bhimesvara Rao, K.	Medicine.
74 Gopalan, S.	Do.
76 Jacob, K. C.	Do.
77 Joseph, T. J.	Do.
*94 Narayana Menon, P. P.	Surgery.
96 Parthasarathi, S.	Midwifery.
96 Paul, Sarah J.	Do.
103 Ramachandra Hebbar K.	Medicine.
*104 Ramachandran, R.	Do.
*114 Selvaraj, A. S.	Medicine and Surgery.
115 Seshadri, T. R.	Midwifery.
116 Seshadrinathan, L.	Medicine.
129 Subrahmanyam, N.	Do.
131 Sundaram, C. S.	Do.
133 Tyagarajan, M. V.	Midwifery.
*136 Vareed, K. P.	Medicine and Surgery.

B. S. Sc. Degree.

PART I.

Register number and name of candidate.

4 Rangachar, P.	7 Subrahmanyam, P. S.
5 Ranganathan, C.	8 Sundaram, T. A.
6 Subrahmanyam, K. V.	9 Venkoba Rao, K. R.

PART II.

SECOND CLASS.

Rank.	Register number and name of candidate.	Register number and name of candidate.
1	18 Sundaram, R.	6 12 Chandramouli Sastri, A.
2	6 Subrahmanyam, K. V.	7 15 Narayanan, N.
3	19 Vaidyanathan, C. V.	8 5 Ranganathan, C.
4	16 Ramaswami, S.	9 17 Rangachari, T. E.
5	11 Bhasker Rao, R.	10 14 Mahadevan, V. S.

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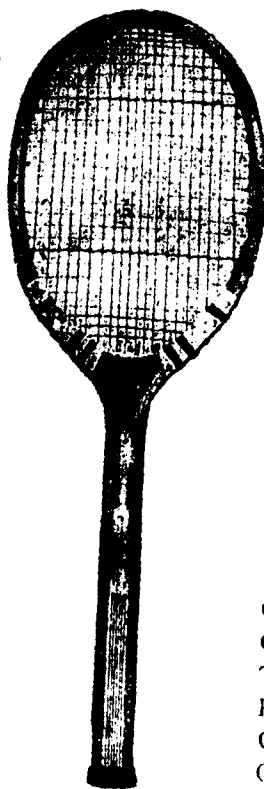
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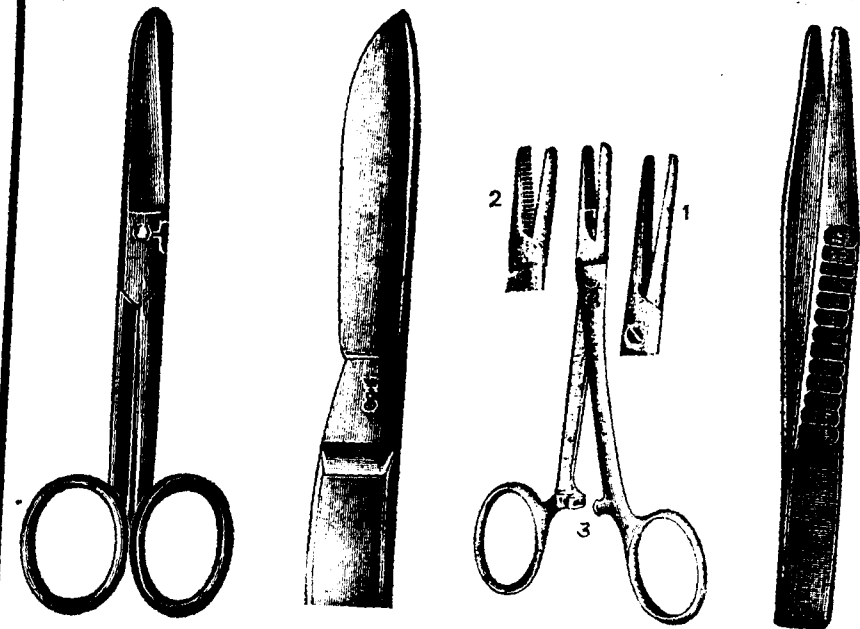
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