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THE MADRAS MEDICAL JOURNAL.

JULY 1924.

ORIGINAL ARTICLES.

PYELITIS IN PREGNANCY AND ITS TREATMENT.

(BY DR. B. V. VARADACHARI, B.A., M.B. & C.M.)

The common predisposing causes of pyelitis are (1) general and (2) local. General causes are exposure and chill, gastro-intestinal disorders, acute infectious diseases including acute infection of throat, and poisoning by drugs such as mercury. Local causes are stone, injuries, stricture of the urethra, and pressure by tumours such as a pregnant uterus. For my present purpose, I am only concerned with the last-mentioned predisposing factor, namely, the pressure by a pregnant uterus. This pressure lowers the powers of resistance of the kidney and makes it liable to be invaded by the ever-ready micro-organisms.

The disease occurs in a pregnant woman, *generally* during the last three months of her pregnancy, as the uterus would exert pressure on the kidneys only during that period. There seems to be no hard and fast rule about this, for you will soon notice that in one of the cases the disease developed after the 5th month and in the other, after the 4th month. If a pregnant woman complains of painful and frequent micturition accompanied with pain and tenderness over the region of the kidney and if her urine shows traces of albumen, we should at once think of

pyelitis. We should not forget the fact that during early pregnancy, symptoms of irritation of the bladder are very common, due to the pressure of the enlarging uterus on the bladder. But micturition is not painful and there is no lumbar pain in these cases. In this connection I quote here the opinion of an Australian Surgeon (the *Medical Journal of Australia*, January 12, 1924). "In the routine examination of the urine of pregnant women, the finding of a trace of albumen is so frequently an indication of pyelitis and not of incipient eclampsia that it should be followed by necessary examination to exclude pyelitis." I should like to know whether this is true in the case of Indian women.

I mentioned above that a kidney that is pressed by a pregnant uterus, loses its power of resistance to micro-organisms. The latter are then the actual cause of pyelitis. Bacillus coli communes is responsible for nearly 80% of the cases. Other organisms that are associated with the disease are streptococcus, staphylococcus, gonococcus and the bacilli of proteus group. Regarding the method of infection, a great deal of controversy seems to be prevalent, but the balance of opinion seems to be strongly in favour of a metastatic infection or infection through blood, in the majority of cases, rather than an ascending infection from the bladder. It is argued that cases of pyelitis very often reveal a normal bladder and a specimen of urine from ureters shows infected urine and hence it cannot be an ascending infection from bladder. Kidd has succeeded in isolating B. Coli from the *blood* of such cases. The disease may be classified as acute and chronic. My first case, as you will presently see, falls under the first category and my second case probably under the second.

As regards the symptoms of pyelitis, the typical symptoms are familiar to you all. They are fever, renal pain, painful and frequent micturition and pyuria or presence of pus in the urine.

Treatment.—The following cases illustrate the difficulty of treating these cases.

No drugs seem to be of value, while the termination of pregnancy, either spontaneous or induced artificially, effects rapid improvement. Hexamine given intravenously probably acts as an abortifacient and in this way acts indirectly in curing the condition.

Case I.—An Indian young lady S.....aged 18 years, who was pregnant 5 months, had an attack of enteric fever, which ran a typical and uncomplicated course. The fever did not interfere with the course of pregnancy. The temperature was normal for a week and on the 8th day, it shot up to 103, preceded by rigor, without any apparent cause. When it kept up like this for two or three days a relapse was naturally feared. The patient complained of pain on the right lumbar region, with painful and frequent micturition. The urine was cloudy and tinged with blood. Examination of the same showed pus cells and red blood corpuscles in abundance under the microscope. There was a trace of albumen.

It was evident that the young lady was suffering from an attack of acute pyelitis which was a sequela of enteric fever, the pregnant uterus acting as a predisposing cause. She was put on hexamine 10 grains three times a day by mouth and the condition of the bowels was attended to. She showed no improvement. As her temperature kept up between 99 and 103 for nearly 8 days it was thought that an intravenous injection of hexamine might

improve her condition. Ten grains of the latter was dissolved in 19 c.c. of sterilised distilled water and injected intravenously. The temperature shot up to 105 within an hour of the injection and came down to 99 within 6 to 8 hours. Twenty-four hours after the injection she had an abortion. The temperature came down the next day and remained normal afterwards. Pus in the urine disappeared within 5 or 6 days after the abortion and the patient made an uninterrupted recovery.. This action of hexamine on the uterus was never anticipated.

Case II.—On 1st February 1924, I was called to see an Indian lady, aged 24 years, with the following symptoms :—pain over the right loin, painful and frequent micturition and slight fever. The duration of the complaint was 3 days. The general health of the patient was good and she was pregnant 4 months. She stated that she used to get slight periodical attacks of pain of short duration over the right lumbar region and the pain would be relieved by pressure. She never had any urinary symptoms before nor was the pain ever so severe as it was on the present occasion. She attributed the present complaint to her bathing in cold water and wearing a wet saree for several hours, three or four days prior to the commencement of the trouble. The urine was found to be turbid and a trace of albumen was noticed. Microscopically a large number of pus cells were detected.

Diagnosis of pyelitis was made. It was possible that she was suffering from a mild form of chronic pyelitis which hitherto caused her no severe symptoms, but had assumed an acute state at present. Her history of previous attacks of pain suggests this inference. Chronic pyelitis is supposed to be common in women.

She had 3 children, all healthy. Previous confinements were normal and she had no abortions.

For a week the temperature ranged between 100 and 102. During the next week, it reached 104 in the evenings, and all the other symptoms were also aggravated. The loin pain was at times unbearable. Partly from this and partly due to her urinary symptoms, she had to spend sleepless nights. Her pulse was 120 per minute and respiration went up to 40. Occasionally she experienced a chilly sensation and her head would frequently be covered with profuse perspiration. She developed bronchitis and complained now and then of pain in the middle of the chest. The pain which was originally confined to the right loin extended to the left side as well.

She was put on a diet of barley-conjee, rice-conjee and milk, and was given plenty of mineral waters, like soda water and lemonade. She was treated with hexamine 10 grains four times a day by mouth, with salines to keep the bowels moving. Antiphlogistine poultices were ordered to be applied over the painful regions. On the assumption that the infection might be due to Bacillus Coli two doses of a stock vaccine—12½ millions and 25 millions—were given at an interval of 4 days. All this treatment was of no avail, and the patient was growing from bad to worse from her septic condition. Spontaneous abortion, which, it was thought, would improve the condition, was awaited but did not occur. The experience of previous case suggested the use of hexamine intravenously. Seven and a half grains was dissolved in 10 c.c. of sterilised distilled water and was injected intravenously at 8 a.m. on 17th February 1924. Within an hour the patient complained of severe

pain over her loins. Gradually the pain extended over the lower abdomen and actual labour pains set in. Abortion occurred at 1-30 p.m., that is, within 6 hours after the injection. She developed the symptoms of shock after the abortion but recovered within a few hours after the administration of pituitrin and stimulants. All the symptoms began to subside from the next day and within four days the temperature reached normal. There was only an evening rise up to 100 for the next 4 days, after which this also subsided. The urine cleared up gradually, but a few scattered pus cells could be detected under the microscope now and then. Hexamine by mouth was ordered to be given till urine showed no traces of pus under the microscope.

More and more liberal diet was given in course of time and the patient's general health improved very rapidly.

In both the above cases, hexamine given by mouth was of no value, but a single dose of the same given intravenously brought on an abortion which was really the cause of the rapid improvement. Are we justified in concluding from the above cases that the drug given intravenously has got an ecbolic action on the uterus ? Further trial, I think, is necessary. May I suggest that my brother medical men should try this treatment in similar intractable cases of pyelitis complicating pregnancy, where spontaneous abortion does not occur within a reasonable period ? And may I request you, gentlemen, to give me now the benefit of your experience in treating such cases ?

My thanks are due to Capt. R. V. Rajam, M.B.B.S., Assistant to the District Medical Officer, Palamcottah, for allowing me to report the first case which was under his treatment.

ABDOMINAL SURGERY IN INDIA—V.

(By Dr. N. S. Narasimhan, *Surgical Registrar, Government Royapuram Hospital, Madras.*)

Affections of Liver and Gall-bladder.

Hydatid cyst.—According to Niblock, this disease is more common in the liver than in any other organ ; but it is not common in India.

Cases of Liver Abscess in Madras General Hospital for 5 years.—There were 129 cases in males with 17 deaths ; no cases in females and children.

Recurrent Liver Abscess.—There were 47 cases—males 37 and females 10 ; only one case of left lobe.

Gall-stones.—Prof. Mayo Robson in Clifford Allbutt's system of medicine writes, "In India, in the tropics generally, gall-stones are said to be extremely rare, only one or two cases having been recorded." This view is in accordance with some of the generally accepted ideas as to the etiology of the disease, such as the predisposing effects of sedantary habits, and tight-lacing in European females, but not among the class of cooly women who come to an Indian hospital. On the other hand a highly farinaceous diet which is nearly universal with most natives of India is said to predispose to the disease..

So far from gall-stones being very rare in the tropics, they are actually more common than in some European climates. Thus in Calcutta 233 out of 4,544 bodies examined showed this ; that is, 5·37% against 4·7% in Brothbank's hospital cases in Manchester.

Race and sex incidence.—

		Hindus.	Muhammadans.	Europeans.	Indian Christians.	Total.
Percentages of different races in 1,040 p.ms.		67·1	21·8	7	3·8	
Incidence of 232 gall-stones in different races.		65·1	16·8	14·7	3·5	
Percentage of sexes of each race is 1,040.	Males ..	74	85	78·4	0	76·5
	Females.	26	15	21·6	0	23·5
Percentage of gall-stones in 4,544 p.ms.	Males ..	3·5	3·8	8·8	0	4·05
	Females.	7·7	4·7	17·1	0	8·1
	Total ..	4·9	3·9	10·7	0	5·37

The above table shows that gall-stones occur in very closely the same proportion as the total subjects in the case of both the Hindus and Indian Christians and only a slightly lower proportion in Muhmmadans, but they were found in double the proper proportion in Europeans. Gall-stones are more frequent in females than in males in Europe. This table also reveals almost the same except among the Muhammadans. This exception is not in favour of the sedantary habits theory because the Muhammadan women are just those who are most shut up in India.

Age incidence.—The frequency of gall-stones increases with advancing age. The table of age incidence of each decade for each race, the total for either sex show a clear steady increase with that of the age of the

subjects. Below 21, just under 2% had gall-stones. Between 21 and 30 the rate was 3·2% with a marked steady increase in the next 3 decades to reach 10% between 51 and 60. Over 60, there was a sudden leap up to 22%. This slightly lower rate of the Muhammadans and the much higher one of Europeans is seen to hold good for each age period in a remarkably constant manner. The study of the above table shows or points to a real predisposition of gall-stones among Hindus as compared with Muhammadans which may be accounted for by the carbohydrate diet of the Hindus; there is also a clear indication of a strong racial predisposition of Europeans in the tropics to suffer from gall-stones as compared with the natives of the country.

Diseases most commonly associated with Gall-stones in India.—No less than 18·2% of the gall-stone cases showed cirrhosis of liver, in $\frac{3}{4}$ of which it was of an advanced degree (5% was seen in 5,000 *post mortems*). In 90% it was of the ordinary multilobular hobnailed variety. In 3 cases Syphilitic, in 1 Intralobular and in addition gummata or their scars were found in 3 cases.

Frequency of Granular Kidney associated with Gall-stones.—Some degree of granular fibrotic disease of kidneys was recorded in no less than 40%, in over $\frac{1}{2}$ of which there was well marked contraction of the organ. The degree of the granular kidney in the total *post mortems* was 3·2%. This points to an undoubted relationship between renal disease and the presence of gall-stones. The extensive destruction of the hepatic and renal secreting cells in fibrotic degeneration necessarily produced marked metabolic changes which may easily be conceived as altering the constitution and consistence of the bile in such a manner as to favour the formation of Calculi.

Frequency of disease of the Gall-bladder and ducts due to Biliary Calculi.—In only 17% was any disease of the Gall-bladder or bile ducts found to have been produced by the concretions. Gall-bladder was seen contracted in 4% and Gall-bladder distended with clear fluid in 2%. Gall-bladder was well thickened in 5·4%. Cystic duct was obstructed in 4%. Primary cancer of gall-bladder was seen in ·9%, Cholycystitis or abscess of gall-bladder in 3% and Gall-stones in hepatic duct in 1·8%. The low proportion of pathological conditions caused by gall-stones in Calcutta is probably due to two factors:—(1) The low average age of the subjects at time of death which allowed of less time for production of the disease which would specially apply to cancer of the gall-bladder. (2) Size and nature of the gall-stones found—a single stone was found in 1/5, and multiple ones in 4/5. 8%, were very small grainlike concretions, 36%, of the size of the pea, 48%, of the size of a hazelnut, the remaining 8% were of still larger size. In two instances a fused mass of stones filling the gall-bladder was noted. The small soft pigment biliary calculi are stated to be proportionately much more common in Calcutta than in London, and this is said to probably account for the low number of gall-stone subjects in India presenting pathological lesions as a result of their presence and also for the small number of operations undertaken for cholyli thiasis in this country.

Cholycystitis.—Only 4 cases are recorded.

Suppuration in the Bile duct within the liver secondary to gall-stones.—Multiple biliary abscesses in the liver is a very rare disease in India. Three cases are recorded. There is a decrease of jaundice when the general condition

becomes worse. This is due to the suppuration loosening the obstructing gall-stones and allowing the bile to once more enter the bowel and is a most important diagnostic sign. These are the only cases of suppuration in the intrahepatic ducts in the 35 years' *post-mortem* records amongst just over 200 liver abscesses, so that they constitute only 1% of hepatic suppuration in Calcutta.

Capt. A. C. Ingram, M.D., I.M.S., in the General Hospital report for 1910, records 7 cases of primary carcinoma of the liver. The relative preponderance of primary carcinoma of the liver in Madrasees as compared with Europeans is most striking.

CLINICAL NOTES.

PREVALENCE OF YAWS IN MALABAR.

(By Dr. M. L. Kamath, B.A., M.D. & C.M.)

M, a Moplah boy, aged 12 years, from Tirurangadi, admitted into the Head-quarter Hospital, Calicut, states that there was at first an abrasion about the middle of the outer aspect of the left leg which was itchy and exuded a serosanguinous discharge. This crusted over in about a week. Two months afterwards patient noticed roundish papules of the size of a green gram which were itchy and had similar

discharge. They got brownish yellow crusts and began to extend at the margin. After about 4 to 5 weeks they would commence to clear in the centres but would not completely heal. On admission these crusts were present —many on the extremities and a few on the trunk and face : the biggest was at the end of the right elbow $1\frac{1}{2} \times 1\frac{1}{2}$ inches ; smallest was pinpoint. On admission there was a musty odor about him.

After admission on 29th January 1924, he had three injections—one on 31st January 1924, another on 8th February 1924 and the third on 17th February 1924, of Novarsanobillon 0·6 gram. After the injections, about three-fourths of the crusts have cleared leaving superficial pigmented patches.

Serous discharge from the crust and specimen prepared from Lymphatic glands by exploring them with hypodermic needle failed to show Trepenoma.

I have seen two similar cases admitted into the hospital last year and I hear such cases are prevalent in Malabar.

A CASE OF CORONARY ANEURISM.

(By. Dr. A. Balakrishnan Nair, L.M.P.)

Body of well nourished and muscular male, aged about 28 years, was brought to the Head-quarter Hospital, Calicut, for *post-mortem* examination on 3rd February 1924 at 2 P.M. He was a cooly in a toddy shop. The police inquest report showed that while cleaning a bench in the toddy shop on the previous day at 9 A.M. he felt giddy, fell down and died immediately, after a few convulsions.

External examinations.—Features were congested. Sclera of a red colour and scleral vessels dilated and prominent.

Internal examinations.—On removal of the sternum with the costal cartileges the pericardial sac was found bulging out prominently. A puncture was made into the pericardial sac and about 8 ozs. of straw-coloured fluid spouted out. Below this supernatant fluid and at the bottom of the pericardial sac there were 10 ozs. of clotted arterial blood. Heart looked big with a broad apex and had patches of fat deposit on its surface. Weight was 15 ozs. The left coronary artery had a fusiform aneurism within half an inch of its commencement, about $1\frac{1}{2}''$ long, $1''$ in diameter. The mouth of the artery admitted the little finger which could be made to go into the aneurism. The walls of the aneurism were very thin and had no fibrinous deposits. Right ventricle was full of blood, partly clotted and partly fluid. Left ventricle empty. Valves healthy and competent. All internal organs and the vessels of the brain were highly congested.

HÆMORRHAGE FROM THE CHOROIDAL PLEXUS OF THE VENTRICLES OF THE BRAIN IN HEART FAILURE.

(By. Dr. M. N. Rao, L.M.S.)

Body of a Moplah fisherman, M, aged about 50 years, sent for *post-mortem* examination with the history that he was found dead in a boat washed ashore, while he had been out for fishing. A little vomit lying by his side had also been sent.

No external marks of injury; well built and muscular, features clean, eyes closed, pupils normal, mouth closed, tip of the nose and lips blue from congestion, and lips stained with blood.

Abdominal fat 1/6″ thick. Heart infiltrated with fat. Apex broad. Weighed 12 ozs. Left side empty. Right

side full of dark fluid blood. Bicuspid valves atheromatous. Aorta slightly dilated and had a number of atheromatous patches at its origin. Water poured into the aorta leaks back into the heart through the aortic valves.

Liver fatty. Weighed 41 ozs.

Lungs, liver, spleen, kidneys, scalp and meninges—all congested. *Both lateral ventricles of the brain were choked with dark clotted blood.*

GLEANINGS.

LIGHT AND HEAT AS THERAPEUTIC AGENTS

By. B. Koven and M. T. Koven, *Brooklyn, N.Y.*

(From the 'Long Island Medical Journal,' April 1924.)

There are numerous physical and chemical remedies in the treatment of disease that depend for their action upon thermic effects. This paper will be limited to physical agents. Furthermore, it will be limited for the sake of brevity to a discussion of newer methods of heat and light therapy.

Therapeutically, heat can be applied by three methods :—

I. Conductive
II. Convective
III. Conversive

Conductive Heat is that which is produced by the body, or parts of the body coming in direct contact with heat producing substances, as hot water bags, heating pads, poultices, or hot compresses. Its action is superficial and varies with the degree of heat applied, from a slight erythema to a severe burn. It produces no general effects, and when used as a remedy, its effects quickly subside with the removal of the applications.

Convective Heat is that transmitted through space. This form of heat is further subdivided into that which is produced by luminous, and that by nonluminous bodies.

In discussing convective heat, we will have to refer to Fig. 1 which is a graphic representation of the rays of light with their position in the spectrum. The wave lengths are generally designated in terms of micra or Angstrom units. An Angstrom unit is equal to one ten millionth of a millimeter, which is about equal to the shortest wave length known.

According to this chart, one will note that the rays are divided into visible and invisible. The visible rays are those having wave lengths between 7500 u. to 4500 u. while the invisible infra red are those whose wave lengths are above 7500 u. and the ultra violet invisible below 4500 u. The chief action of these rays are thermal and chemical. The infra red rays have the greatest thermal action ; and as the rays approach the ultra violet, their thermal action becomes less and their chemical action greater.

The two main sources of light are ;—

I. Sunlight
II. Artificial

Sunlight :—In travelling through the clouds the sun's rays lose many of their valuable properties. It is estimated that there is about 20% loss at sea level ; while at mountain tops, as in the Swiss Alps, there is about 6% loss in energy. Furthermore, the ultra violet wave lengths (the rays of shortest lengths) are absorbed by glass or material of any consistency except quartz. The best effects of sunlight are derived at high altitudes. There are absolutely no chemical effects behind closed windows or through clothing.

Sunbaths are of benefit in the following ways.

1. By promoting perspiration ; as the result of this action harmful and toxic products are eliminated.
2. By the stimulation of metabolism.
3. By the stimulation or sedation of the nervous system resulting in improvement of appetite and better sleep.
4. By the direct action of the light upon the blood which can be discussed more fully under ultra violet light.

Artificial :—In consideration of the other source of light, the principles of the spectrum will be followed. All apparatus or instruments for the production of artificial light have different properties which correspond with different qualities in rays of different wave lengths.

At the proximal end of the spectrum chart are found the invisible infra red rays. A therapeutic apparatus has recently been devised producing and utilizing only these rays. The efficiency of this apparatus cannot be stated at present ; but it will be noted later that the properties of the high frequency currents are practically similar and more penetrating. Then comes the carbon filament bulb which contains a great deal of red rays, chiefly those of the proximal end of the visible field. Due to its low penetrative powers and high thermic action, its physiological effect is the production of a superficial hyperemia. Then comes the tungsten or nitrogen bulbs which possess a thermal action of deeper penetration since these bulbs contain more rays of shorter length coming from the distal end of the visible spectrum. With our increased knowledge of the therapeutic value of light, the carbon incandescent lamp is being gradually discarded for the nitrogen filled or tungsten filament bulb. With the latter the subcutaneous blood vessel dilatation is deeper and more lasting, while its general body effects are greater.

Luminous heat therapy is administered both locally and generally. For local treatment there are numerous makes of lamps which consist of a hood surrounding various sized bulbs, and can be adjusted for application to almost any part of the body. The indications for the use of local therapy of these lamps are :—

1. The Carbon filament is preferred in local and superficial inflammations as in infected sinuses, otitis media, or in superficial inflammation of the extremities as phlebitis, or lymphangitis where it frequently aborts suppurative complications. In the use of the small candle power lamps especially around the face it is advisable to use a blue or violet screen over the hood. This eliminates the severe heat rays and prevents superficial burns or irritations to the eyes, and the light can be used for a greater length of time.

2. The pure white light as emitted by the nitrogen filled or tungsten lamps is preferred :—(a) In the relief of pain, especially in localized neuritis, myositis, and arthritis; (b) In sluggish healing wounds, where it stimulates granulations ; (c) post operative treatment of infected wounds, especially since Crile and Ochsner have indicated its use in these conditions ; (d) preliminary heating before using other forms of electro-therapy, as diathermia, ultra violet, and low tension currents, because a cold muscle does not respond readily to the passage of these currents. Hence the superficial hyperemia produced by the lamp makes the other treatment more effective ; (e) as a valuable application in hospital work, especially in post operative shock.

For general body treatment with the luminous heat the electric light bath cabinets are used. These are made in two styles (1) The upright bath cabinet in which the patient is seated on a stool within the cabinet so that the entire body is equally exposed to various numbers of small incandescent bulbs ; (2) the reclining cabinet which is constructed like a couch, built up on the sides and covered by a hood. The lamps are arranged on the sides and on the hood of the cabinet.

The effects of these cabinet baths are :—

1. To induce intense peripheral hyperemia and thus produce decongestion of deeper organs.

2. To increase elimination by way of the skin and lungs. It has been found that during and following a bath the elimination of CO^2 is practically doubled, while the profuse perspiration produced carries away much toxic material and in this way prevents overtaxing of the kidneys. One also finds that the urine is heavier in solids. Therefore these cabinet baths are indicated in the treatment of :—

(*a*) Polyarthritis and gouty cases. The vascular hyperemia besides producing a local analgesic effect stimulates elimination through all organs of excretion.

(*b*) Hypertension, whether essential or secondary. The benefit derived is due to vascular relaxation and increased elimination.

(*c*) General light exposures frequently are of benefit in the treatment of conditions with localized symptoms as in sacro-iliac sprain, sciatica, or flat feet. The baths produce a relaxation of the

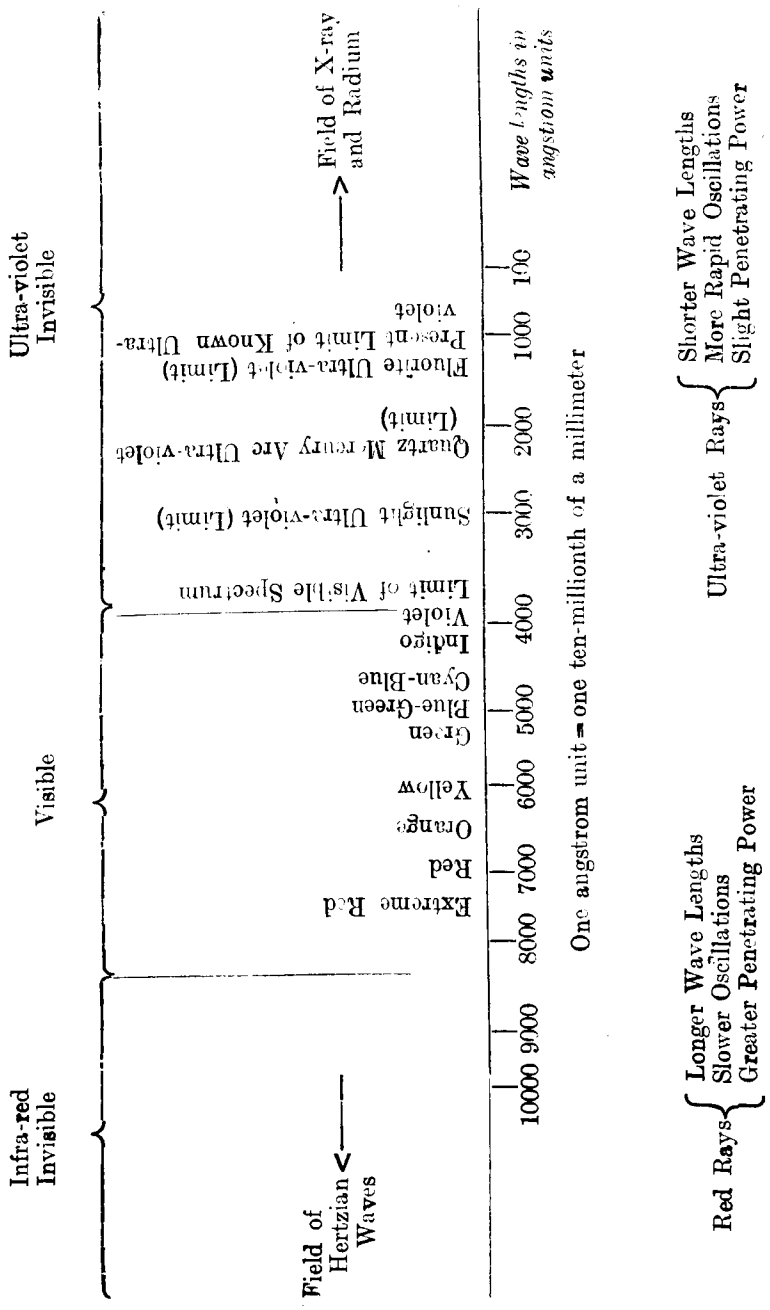
spasm of the muscles protecting the parts affected, especially when these spastic muscles extend over a considerable area. ,

As for the non-luminous sources of convective heat for local treatment there are various forms of hot air bakers which consist of various sized and shaped hoods, heated from without by means of burning alcohol lamps, illuminating gas, or within the hood by the use of electrical heating filaments or hot wires. These baking apparatuses have greater heating capacity than the luminous lamps and, therefore, produce a more intense superficial hyperemia, and find their greatest field of usefulness in localized superficial infections of the extremities. The parts to be treated must be very carefully protected and the only guide is the patient's reaction. With the luminous bakers the part to be treated is constantly under visible inspection and it is much easier to apply them. Furthermore, for treatment of deep seated pathological conditions luminous bakers are again preferable on account of their greater penetrating power.

For general body treatment with the non-luminous heat applicators, besides the body hot air bakers, there are the Turkish and Russian baths. The advantage, as noted before, in the applications of the light baths over the hot air, is due to the fact that the thermic effects of the electric bath cabinet extend deeply into the subcutaneous tissues, while the other, or non-luminous baths produce no effect below the skin.

Referring again to the spectrum Fig. 1 we approach a very important field in luminous therapy known as ultra violet light. This field has been a subject of much discussion in recent medical literature, receiving attention not only from physicists, biologists and physiologists, but also physicians who were never before interested in physiotherapy. Before discussing ultra-violet as obtained from modern apparatus, it would be proper to call attention to some of the older mechanisms and give credit to the great pioneer in this form of therapy—Finsen, the founder of the Light Institute of Copenhagen. He perfected a carbon arc lamp for the treatment of skin diseases. The mechanism of this lamp is somewhat complicated consisting of a heated arc lamp scattering divergent rays, rich in ultra violet. These rays are paralleled by a set of mirrors, and by means of lenses the rays were concentrated. This lamp has been used successfully by him in the treatment of Lupus Vulgaris. The English are still using an open arc lamp deriving its source of energy from burning "Wulfram" (a tungsten ore rich in ultra-violet).

The most modern method of producing ultra-violet ray is by means of a mercury vapor lamp. The principle of the production of ultra violet in these lamps depends upon the heating of mercury in a vacuum in a quartz burner to an extreme degree, which process produces a vapor very rich in ultra violet. Quartz is used because its consistency is so tense that the extreme degree of heat will not crack the crystal, and because it allows more actinic rays to pass through than any other known substance.



There are two types of mercury quartz lamps:—

The air cooled lamp.

The water cooled lamp.

The air cooled lamp is used for general exposures and treatments. The lamp is placed at a distance of 30 inches above the part to be treated. The first treatment is usually between one and three minutes duration. As treatments are continued the duration of the time exposure is increased, and the distance between the burner and the part treated is decreased gradually until a distance of about 10 inches is reached. Ultra violet treatment is usually preceded by the use of radiant light treatment of 10 to 20 minutes duration, because this produces a superficial hyperemia which makes the ultra violet more effective since it is more readily absorbed by the increased blood supply. This is of value because the penetration of the ultra violet is superficial to the extent of about a quarter of an inch, and the general reaction is due to the vascular absorption of the rays. In giving general body treatment the eyes should be protected to avoid a conjunctivitis which, while exceedingly painful, is not destructive.

The air cooled lamps in this country are manufactured either by the Burdick Co., or the Hanovia Chemical Co., whose trade name for the air cooled lamp is the **Alpine lamp.** The water cooled lamps are also manufactured by the same firms, but the commercial name of the Hanovia Co. Lamp is the **"Kromayer."**

Water cooled lamps can be used for the treatment of either local skin surfaces or any of the body cavities. The latter action is obtained by placing, in close contact with the quartz tube of the lamp, various applicators which fit the different body cavities. These applicators consist of quartz crystals moulded in various shapes and sizes necessary. The length of the time for treatment varies with the results to be obtained, the duration of the application being from 5 to 15 minutes. The applicators are placed in close contact with the treated part and compression is used to shut off the local blood supply. This concentrates the entire action of the ultra violet locally and prevents its absorption by the blood stream.

In discussing the therapeutic indications of ultra violet, its value is to be considered from :—

1. Its bactericidal action.
2. Its oxidizing or reducing action.
3. Its hyperemic acton.

One of the greatest qualities that ultra violet possesses is its bactericidal action. In fact the bactericidal power of sunlight is attributed to the ultra violet rays. How these rays destroy bacteria is not definitely known. Whether this is produced by its oxidizing power, or coagulation is not known; it possibly may be due to the direct action upon the bacteria.

In the treatment of wounds, healthy granulations are stimulated by the oxidation, by the intense hyperemic action and by the superficial destruction of bacteria. Hence it is used in sluggish wounds

due to poor vascularity. Furthermore, advantage can be taken of this in the sterilization and stimulation of granulations preparatory to skin grafting. In numerous instances large granulating wounds and varicose ulcers have been observed to heal rapidly under ultra violet treatment.

In skin diseases, the local reaction of ultra violet rays is similar to an intense exposure of sunlight. The erythema produced commences about 5 to 6 hours after the exposure and will persist for several days and even weeks. Itching is usually associated with this intense reaction and can be relieved by the application of cold cream, carbolated vaseline, or by subsequent exposure to white light. Prolonged local or general exposures will cause a second degree burn or blistering that is followed in a few days by desquamation. When the crust falls off entirely, it leaves a clear, newly formed skin. This explains the manner of its action in skin diseases. Eczema is among the favourable conditions for treatment with the actinic rays. The ultra violet acts as a local irritant and also, on account of its systemic effects, produces results in such conditions as eczema—which is but a local manifestation of some etiological factor to be found in deeper structures. The same can be said of the alopecias. We have seen some wonderful improvement in the clearing up of seborrhœa of the scalp with the growth of new hair. What is true of the epidermis is also true of some diseases that effect the dermal and subdermal tissues. Naevi and lupus are removed. In the later conditions, the water cooled lamp by the compression method is used. Telangiectasis and X-ray burns are also conditions which yield to the action of ultra violet.

Tuberculosis :—Various writers have come out with undenying evidence proving ultra violet as a great auxiliary in the treatment of tuberculosis, both pulmonary and surgical. Upon thorough investigation of the subject, it can be said that in surgical tuberculosis, whether affecting skin, glands, bone, or joints, there is absolute indication for its use. We have seen latent tuberculosis of the lung stirred up to activity by the use of ultra violet applied to a bone lesion. As Sampson states in the treatment of surgical tuberculosis accompanied by a pulmonary lesion, one must not give too vigorous treatments, because he finds that vigorous local treatment stirs up an allergic reaction. In a manuscript by R. Gassell, Leipzig, 1921, a chart is found (this is also used by Janet H. Clark, Baltimore, in her splendid monograph on the Physiological Action of Light) which shows the percentage of cures in surgical tuberculosis under different methods of treatment. The percentage of improvements and cures are much higher with radiation therapy as contrasted with surgery, or no treatment.

Rickets :—Dr. A.F. Hess with his co-workers in numerous contributions to the literature on this subject sums up the specific effect of light upon rickets by stating that under light therapy the curative process is not only demonstrated by the ordinary physical examinations, but also by X-ray findings of the epiphyses; and also shows that there is an increase in the organic phosphates of the blood. Dr. B. Kramer of Johns Hopkins in a recent presentation of the value of ultra violet in rickets, maintains that there is some chemical property in the ultra violet which produces calcification by uniting the calcium and the phosphorus—the combination of which is equal to about 90% of bone. This was done without the aid of cod liver oil or phosphorus.

Several cases of neuritis and myostitis have been at times relieved by the application of ultra violet. The results are obtained by the counter-irritation and the consequent removal of deep congestion.

In gynaecology splendid success is being obtained in such cases as Niesserian infections, pelvic inflammation, endometritis, erosions, endocervicitis, and pruritis vulvae. These treatments are usually administered with the water cooled lamp with special vaginal and uterine applicators applied through a vaginal speculum.

In nose and throat work there is a great deal of literature upon its value as a remedy in chronic catarrhal and sinus troubles, hay fever, hypertrophied tonsils, and affections of the larynx.

In dentistry, work is being done with the water cooled lamp and special applicators in the treatment of pyorrhea.

The question has been raised—why employ ultra-violet when sunlight can produce the same reaction? The advantages of ultra-violet are (1) its constancy of usage; (2) its intensity is not variable; (3) the dosage is better regulated, and (4) the reactions are more uniform.

A great deal of confusion exists in the minds of physicians in regard to what is known as the violet ray and the ultra-violet. The violet ray is a high frequency current passed through a vacuum tube producing the visible violet of a higher wave length. Its effect is chiefly thermic; and it has some penetrating action with a production of a hyperemia coming on immediately at the time of application. This leads on to the third method of heat therapy.

Conversive Heat :—With the introduction of high frequency currents we have a new and very valuable form of heat therapy. Its action depends upon the heat produced in the various tissues by their resistance to the entry and passage of this current. This high frequency is an alternating current of oscillating or vibratory nature made to change its direction of flow many thousand times per second. The current is obtained from a high frequency or induction apparatus which for therapeutic uses must be raised to a voltage above 5,000.

The different methods whereby high frequency currents are used as therapeutic agents are :—

1. From the unipolar or Oudin tap. This is applied by exciting various shaped and sized closed glass vessels from which the air has been sufficiently exhausted to render the residual gas as good a conductor as possible. These are known as vacuum tubes. The treatment is given with these tubes applied to the bare surface of the parts to be

treated. As mentioned previously this is known as a violet ray treatment because the high frequency current going through this partial vacuum produces a violet color in the tube. The main therapeutic effects of this treatment is local heat. If the tube is raised slightly from the skin, or if there is any intervening substance between the tube and the skin, a torrent of sparks passes across the gap and produces counter-irritation. These tubes can be used locally on the skin or within the cavities of the body.

2. For more important therapeutic use of high frequency there is diathermia which is derived from the bi-polar or Darsonval taps. Diathermia is an electrical energy that produces heat effects in the depth of the tissues. This current is also known as thermo-penetration, transthermy, or endothermy.

Diathermia is divided into two main fields of action

1. Medical. 2. Surgical.

The medical use of diathermia is further divided into

a. General. b. Local.

General diathermia is given to raise the general body temperature, thereby increasing oxidation and metabolism. Its action is that of peripheral vaso dilatation with a corresponding decongestion of deeper parts. The general treatments are given in a chair, or on a couch, with the patient holding an electrode or electrodes connected with one pole of the machine. The other pole is attached to a large metal plate (the length of the entire body) which is separated from the patient by a covering of three inch thickness of non-conductive material as Japanese floss or by a hard rubber or bakelite cover. In this technique the body is charged in the same manner as the outer coating of a Leyden jar. This is really an indirect general diathermia, or popularly known as autocondensation. The sensation experienced by the patient is a slight warmth especially across the wrists but after treatment of about ten minutes with the use of about 800 milliamperes of current a general warmth is experienced. The body temperature is raised one or two degrees. After treatment there is usually a fall from 20 to 40 points in the systolic blood pressure, with a corresponding fall in the diastolic. Indications for this treatment would be hypertension and general states of hypoactivity as in sub-thyroid conditions, chronic arthritis, etc.

For local medical diathermia, the bi-polar taps are connected through suitable conducting electrodes. Here the chief action is between the interposing electrodes. High frequency currents flow in straight lines passing through any given resistance. Furthermore, the greater the resistance encountered by the current the greater is the heat in the resistive surface; so that in heating an extremity the interposed bone, which offers the greatest resistance to the current, will have the greatest accumulation of heat.

The best and most convenient electrodes are malleable metal plates of a zinc and lead combination, commercially known as 22 gauge tin. This moulds very readily to any part, and before application

should be moistened with soap and water. In treatment of a part the electrodes are placed in such a manner that the greatest heat intensity is concentrated at the seat of pathology. This can be accurately determined by varying the size and the position of the plates. These plates are held in position by a cotton elastic bandage. The latter allows for the expansibility of the tissue resulting from the increased vascularity produced by heat.

The effect produced by the heat is really the only artificial method in the imitation of nature's method of curing deep seated lesions or disease. The effect is that of the cardinal principles of inflammation, redness, swelling, and heat which is not pathological but rather physiological or a reactive process. It is known that all manifestations which produce an adequate inflammation tends toward resolution.

In considering different methods of application of local diathermia, the number of which is legion, a few specific conditions will be considered where diathermia is especially indicated; and different techniques described.

Fractures:—Diathermia can be used both in the hastening of formation of callus or when callus is excessive. The technique used depends entirely upon the desired result. Where there is excessive callus, a sedative technique is used whereby the current is gradually introduced and brought to its peak in about five minutes after onset. The peak means the highest amount to be used in any given case, which depends mainly upon the size of the plate surface covered by the electrodes used, and the distance between plates. The dosage figured is usually 1,000 milliamperes for every 16 square inches of plate surface. The current is kept at the highest point for about 15 to 20 minutes, and is then decreased so that the current is shut off in about one or two minutes. This produces a slow, lasting hyperemia, and an increased blood supply, thereby washing out some of the plastic exudate by opening the lymph spaces which results in the carrying off of the excess of the migrating cells and products of vascular stasis produced by the original injuries. In cases of delayed healing or non-callus formations, a stimulating technique is used which consists in getting at the peak of the current suddenly and shutting off suddenly. This is repeated several times for about five or seven minutes. A new attachment to the diathermia current which rythmically breaks the current can be used in this connection. This method may be likened to the tamponment in ununited fractures as advocated by Sir Robert Jones.

The above sedative technique has also been employed successfully in dissolving calcifications of bursae and tendons. The same technique has also been employed in the treatment of abdominal adhesions. A few cases of coronary sclerosis the full reports of which are not ready for publication, have been treated by this method with marked clinical success.

In neuritis, the sedative technique is employed; but our aim has been to apply the diathermia directly to the source of spinal exit of

the nerves. For instance, in a brachial neuritis, a small plate is placed over the tender area around the cervical and dorsal exits of the nerve, and a much larger plate is placed directly opposite on the other side of the neck or the axilla on the unaffected side. In sciatic neuritis, which in our experience is a very rare disease per se but usually secondary to some arthritic or soft tissue changes in and around the lumbar or sacro-iliac joints, we find the best method of approach by the insertion of a metal electrode into the rectum and a metal plate over the affected vertebral region.

In arthritis, diathermia is a very valuable form of therapy if one or two joints are involved. To apply diathermia locally to many joints would be very tedious because each joint treatment should take not less than 30 minutes. The most gratifying results of diathermia have been obtained in the treatment of gonorrheal arthritis. In this condition, not only must the joint involved be treated, but also care must be taken of the focal source by using rectal diathermia. By this means we can introduce into the prostate or the pelvic organs a marked increased heat production much larger than the organism can withstand. It is remarkable to note the quick results of the treatment in this very painful condition.

Numerous and varied kinds of chronic diseases have been treated with diathermia, but it is not within the scope of this paper to deal with all of them.

A few of the contra-indications in the use of diathermia must be mentioned :—

Never use diathermia :—

1. Over anesthetic areas.
2. In enclosed pus cavities that are not properly drained.
3. In cases of threatened pulmonary hemorrhage.
4. In cases of low blood pressure.

In conclusion, we desire to mention a few words in regard to surgical diathermia. This can be applied by either the unipolar, or the bipolar method.

The unipolar method consists of an insulated handle with a sharp or fine pointed electrode (usually an ordinary sewing needle is employed) connected to the Oudin or the unipolar tap. By a method that was developed by Dr. W. L. Clark of Philadelphia called electro-dessication, he uses the smallest amount of current obtainable from the machine. This produces a dehydration or drying of the parts treated, with a subsequent desquamation and resultant formation of healthy tissue instead of a scar. He is employing this method with success in the treatment of hypertrophied tonsils and hemorrhoids. In the same manner can be used the bipolar method where the concentration of the heat current is at the point of the active pole. The inactive pole, consisting of a large metal plate, is placed at a distance from the part to be treated. This method is usually employed in place of cauterization by other means. Its advantages over the actual cautery are that it is less painful ; that it leaves a dessicating surface so that the resultant scar is smooth as compared to the fulguration produced by the cautery. Furthermore, there is less liability to secondary hemorrhage. Its indication is well known to the genito-urinary surgeons in the removal of bladder growths, and to the dermatologists in the removal of warts and other superficial growths, either benign or malignant.

MATTERS MEDICAL IN THE LEGISLATURES.

THE NURSES AND MIDWIVES REGISTRATION BILL.

Under rule 18 of the Madras Legislative Council Rules the following Bill, together with the Statement of Objects and Reasons, is published for general information :—

BILL No. 11 OF 1924.

The registration of nurses and midwives in the Presidency of Madras.

WHEREAS it is expedient to provide for the registration of nurses and midwives in the Presidency of Madras, AND WHEREAS the previous sanction of the Governor-General has been obtained to the passing of this Act ; It is hereby enacted as follows :— **Preamble.**

1. (1) This Act may be called the Madras Nurses and Midwives Act, 1924. **Short title.**

(2) It shall extend to the whole of the Presidency of Madras. **Extent.**

(3) It shall come into force on such date as the Local Government may, by notification, appoint. **Commencement.**

2. In this Act, unless there is anything repugnant in the subject or context— **Definitions.**

(*a*) 'Council' means 'the Madras Nurses and Midwives Council established under this Act'.

(*b*) 'Prescribed' means 'prescribed by rules or by-laws made under this Act'.

(*c*) 'Register' means 'a register maintained under section 5' and 'registered' means 'registered in accordance with the provisions of that section'.

3. (1) A Council, called the 'Madras Nurses and Midwives Council', shall be established for the Presidency of Madras, which shall consist of twelve members who shall be appointed in the manner following :— **Constitution of the Council and the term of office of members.**

(*a*) By virtue of his office the Surgeon-General with the Government of Madras who shall be the President of the Council ;

(*b*) by virtue of his office the Superintendent of the General Hospital, Madras ;

(*c*) two Registered Medical Practitioners to be nominated by the Local Government ;

(*d*) two Registered Medical Practitioners to be nominated by the Medical Council established under section 5 (1) of the Madras Medical Registration Act, 1914;

(*e*) two matrons of recognized hospitals, one to be nominated by the Surgeon-General and the other to be elected by the registered nurses and midwives and approved by the Surgeon-General. The election shall be in the manner prescribed by the Council;

(*f*) one registered nurse to be elected by the registered nurses and one registered midwife to be elected by the registered midwives in the manner prescribed by the Council; and

(*g*) two non-officials, not of the classes referred to above, to be nominated by the Local Government:

Provided that in the case of first appointments to be made under this Act, the second matron referred to in clause (*e*) shall be nominated by the Surgeon-General and that in the place of the registered nurse and registered midwife specified in clause (*f*), the Local Government shall nominate a nurse and a midwife having such professional qualifications as the Local Government deem suitable.

(2) The members of the Council other than ex-officio members shall hold office for a term of three years.

(3) If the place of a member of the Council becomes vacant before the expiration of his term of office whether by death, resignation or otherwise, the vacancy shall be filled by appointment in the manner provided by sub-section (1).

(4) Any member ceasing to be a member of the Council shall be eligible for re-appointment.

(5) The powers of the Council may be exercised notwithstanding any vacancy in the Council.

Effect of failure to attend meetings of the Council.

4. The Council may, at its discretion, remove any member who without leave fails to attend three consecutive meetings of the Council.

Registration of nurses and midwives.

5. (1) The Council shall maintain a register of nurses and a register of midwives and in each such register shall be entered in two separate parts—

(i) the names of all nurses or midwives entitled to registration under clause (*a*) or clause (*b*) of sub-section (2) as the case may be, and

(ii) the names of nurses or midwives already in practice who are permitted to register under clause (*c*) of sub-section (2).

(2) The following persons shall be entitled to registration under this Act, namely:—

(*a*) Nurses who have undergone the three years' course of training in a recognized General Hospital, have passed the final qualifying examination and obtained the diploma in General Sick Nursing and fulfil the further conditions prescribed respectively therefor.

Explanation.—Nurses who undergo the three years' training in a women and children's hospital approved by the Council shall be eligible for registration but may be employed only in hospitals for women and children. An additional course of training for six months in a recognized General Hospital shall qualify them for employment as nurses in a General Hospital.

(*b*) Midwives who have undergone a course of training for one year in midwifery and gynæcology in a recognized maternity hospital, have passed a qualifying examination and obtained a diploma in midwifery, and fulfil the further conditions prescribed therefor.

(*c*) Nurses and midwives already in practice in the Presidency of Madras at the commencement of this Act and not entitled under clause (*a*) or (*b*) subject to such conditions and restrictions as may be prescribed respectively therefor.

Removal and restoration of names.

6. Subject to such conditions and in such manner as may be prescribed, the Council may remove the name of any nurse or midwife from the register or restore thereto the name of any nurse or midwife which has been so removed.

Appeal from Council to Tribunal.

7. (1) Any nurse or midwife aggrieved by an order of the Council may, within three months from the date on which notice of such order is given to her, appeal against the order to a Tribunal consisting of three persons selected as follows:—

(*a*) One to be selected in rotation from a panel of not less than six persons possessing not less than twelve years' experience as a Magistrate or Civil Judge to be nominated by the Local Government in consultation with the Chief Justice of the High Court at Madras.

(*b*) One to be selected in rotation from a panel of not less than six registered medical practitioners to be selected in the prescribed manner by the Medical Council established under section 5 (1) of the Madras Medical Registration Act, 1914.

(*c*) One nurse who holds both general and maternity certificates to be selected from a panel of not less than six such registered nurses selected in the prescribed manner by the registered nurses and midwives.

(2) The order of the Tribunal shall be final.

Appeal to the Local Government against refusal by the Council to approve training institution or person.

8. Any person aggrieved by the refusal of the Council to approve any institution or person under any by-laws relating to training made under this Act may appeal against the refusal to the Local Government and the Local Government shall give such directions as it thinks proper and the Council shall comply with any directions so given.

Disabilities of unregistered persons.

9. No woman shall, after the expiry of one year from the commencement of this Act, be competent to hold any appointment as nurse or midwife in any dispensary, hospital, asylum, infirmary or

lying-in hospital, which is supported entirely or partially by public funds or by the funds or contributions of any public company, unless she is registered as such under this Act.

No woman who does not possess a certificate of the recognised three years' training in the case of a nurse or of the one year's training in the case of a midwife shall be registered after the expiry of two years from the date on which this Act comes into force.

Rules by the Local Government.

10. (1) The Local Government may, after previous publication, make rules to carry out all or any of the purposes of this Act not inconsistent therewith.

(2) In particular, and without prejudice to the generality of the foregoing power, it may make rules—

(*a*) regulating the constitution and procedure of the Tribunal specified in sub-section (1) of section 7;

(*b*) prescribing the fees to be paid in respect of an appeal under this Act;

(*c*) determining the manner in which fees levied under this Act and all other moneys received by the Council shall be applied.

By-laws by the Council.

11. (1) The Council may make by-laws not inconsistent with this Act or any other law—

(*a*) for regulating the formation, maintenance and publication of the register;

(*b*) for regulating the conditions of admission to the register;

(*c*) for regulating the conduct of any examinations which may be prescribed as a condition of admission to the register, and any matters ancillary to or connected with any such examinations;

(*d*) for regulating the conduct of elections of members of the Council and of the selection of the panels referred to in section 7;

(*e*) for regulating, supervising and restricting within due limits the practice of registered nurses and midwives;

(*f*) for prescribing the causes for which, the conditions under which and the manner in which the nurses and midwives may be removed from the register and the procedure for the restoration to the register of nurses and midwives who have been removed therefrom;

(*g*) for regulating the publication of the names of registered nurses and midwives and their residences;

(*h*) for prescribing the rates of fees to be charged for examinations prescribed for admission to the register and for registration;

(*i*) for regulating the grant of leave to the members of the Council;

(*j*) for regulating the summoning of meetings of the Council and its proceedings; and

(*k*) for regulating the expenditure of the Council and providing for the audit thereof.

(2) No by-law made by the Council shall come into force until it has been confirmed by the Local Government.

(3) Every such by-law shall, when so confirmed, be published.

Disposal of fees.

12. All fees lieved under this Act and all other moneys received by the Council shall be applied for the purposes of this Act and in accordance with such rules as the Local Government may make in this behalf.

Penalty for dishonest use of certificate, for procuring registration by false means and for falsification of register or certificate.

13. Any person who—

(*a*) dishonestly makes use of any certificate of registration issued under the provisions of this Act to him or to any other person,

(*b*) procures or attempts to procure registration under the provisions of this Act by making or producing or causing to be made or produced any false or fraudulent declaration, certificate or representation whether in writing or otherwise, or

(*c*) wilfully makes or causes to be made any false representation in any matter relating to the register or the certificates issued under the provisions of this Act;

shall be punishable with fine not exceeding two hundred and fifty rupees or with imprisonment for a term which may extend to six months or with both.

Penalty for posing as registered nurse or midwife by a person who is not such.

14. (1) Any person, who, not being a registered nurse, takes or uses the name or title of registered nurse or uses any name, title, description, uniform, badge or signboard, implying that such person is a registered nurse, shall be punishable with fine not exceeding one hundred rupees or with imprisonment which may extend to one month or with both.

(2) Any person, who, not being a registered midwife, takes or uses the name or title of registered midwife or uses any name, title, description, uniform, badge or signboard, implying that such person is a registered midwife, shall be punishable with fine not exceeding fifty rupees or with imprisonment which may extend to one month or with both.

Magistrates empowered to try offences under this Act.

15. No Magistrate other than a Presidency Magistrate or a Magistrate of the first class shall take cognizance of or try any offence under this Act.

STATEMENT OF OBJECTS AND REASONS.

Alike in the interests of the public, who must not be exposed to the risk of attendance by nurses and midwives who have no qualifications and in those of qualified nurses and midwives whose qualifications should be recognized, it is necessary that legislation is undertaken. Equally necessary it is that the qualified nurses and midwives are

placed under some disciplinary control. Such legislation obtains not only in England but also in Burma and it is felt that the time has arrived for passing an enactment on similar lines in this Presidency.

This Bill follows with slight modifications necessitated by local conditions the Burma Act on the subject, viz., Act X of 1922, which itself follows in the main the English Act, viz., the Nurses Registration Act, 1919.

12*th July* 1924. C. P. RAMASWAMI AYYAR.

LEE COMMISSION REPORT.

The recommendations that have special reference to the Medical services are as follows:—

"Bearing in mind that there must be an adequate military reserve, and that civil medical administration is now in charge of Ministers, we think that on the whole the following solution is worthy of consideration:—

(*a*) That, while all concessions granted to other All-India Services should be extended to the existing members of the Indian Medical Service in civil employ, no attempt should be made to perpetuate that Service as at present constituted.

(*b*) That, contrary to the recommendation of the Verney-Lovett Committee that the Indian Medical Service should be developed into a new "Indian Medical Corps" which should absorb the Royal Army Medical Corps in India, the medical needs of both the British and Indian Armies in India should be provided for, in future, by the Royal Army Medical Corps (India) which should absorb the Indian Medical Service.

This is the scheme proposed and elaborated by the late Director of Medical Services (Lieutenant-General Sir Charles Burtchaell), and full details will be found in Appendix II.

This being mainly a military question, it would not be fitting that we should attempt to expound or argue the merits of the Burtchaell scheme, beyond saying that, in our view, it is capable of adaptation to meet the requirements of the Provinces for a separate civil medical service and to provide the necessary nucleus of British medical officers which we regard as vital to the needs and contentment of British civil servants in India.

23. Our consequential recommendations are as follows:—

(*c*) A Civil Medical Service should be constituted in each Province and recruited, for the Local Government, by the Public Service Commission (see Chapter IV) on the basis of a competitive examination both in England and India. The standards for this examination should be fixed by the Public Service Commission in consultation with the Local Governments, the Director-General, Indian Medical Service (or the corresponding officer with the Government of India), and the Medical Adviser to the Secretary of State in England.

The rates of pay and other conditions of service should be fixed by the Local Government in consultation with the Public Service Commission.

It should be part of the terms of contract that every officer of the Civil Medical Service should be liable for service with the Royal Army Medical Corps (India) in the event of a war involving a general mobilization.

(*d*) The minimum number of British officers to be maintained in the Civil Medical Service should be determined by the Secretary of State, in consultation with the Government of India and the Local Governments concerned, on the basis of paragraph 93 (*a*) of this Report. This number should not be varied except by order of the Secretary of State, and the responsibility for its maintenance should in the last resort rest upon him.

(*e*) Of this prescribed British element in the Civil Medical Service, one-half (or a number not less than that of British Medical officers from civil employ, needed for the Regular Military Reserve,* whichever is the larger) should be reserved for British officers to be seconded from the Royal Army Medical Corps (India) in the manner suggested in the Burtchaell scheme, the remainder being obtained through the competitive examination referred to in (*c*) above.

(*f*) If the quota of British officers required to complete the authorized establishment referred to in (*d*) above cannot be obtained by the Local Government, under the system prescribed in (*c*), the deficiency should be made up, so far as practicable, by increased seconding of officers from the Royal Army Medical Corps (India).

Failing the requisite number from that source which in our view is an unlikely contingency, it is for consideration whether the deficiency could be made up by special additional recruitment by the Royal Army Medical Corps (India) of officers who could be detailed temporarily for service in the Civil Department and be available as an addition to the Regular Military Reserve.

*** On this point we have proceeded upon the assumption that the quota of military medical officers from civil employ required for the Reserve will not exceed the total (122) specified in the D.M.S.'s memorandum of 2nd July, 1922, attached to Government of India Despatch No. 1 of 1923 (Department of Education and Health).**

(*g*) With regard to the professorial appointments in Government Colleges and Hospitals, we draw attention to the specific recommendation made by the Islington Commission in paragraph (xxx), at page 268 of their Report. A distinction is there drawn between the clinical chairs, which should be reserved, for so long as a fit person is available, for officers of the Civil Medical Services, however recruited, and the scientific chairs, which should be thrown open to all candidates. We are disposed to agree with these recommendations, subject to the substitution of the Public Service Commission for the Recruiting Committee referred to at page 268 [in paragraph (xxxiv)] of the Islington Commission's Report."

" *Medical attendance.*

93. The almost universally expressed anxiety of British members of the Services in India to have access to British Medical advice for themselves and their families is intelligible and, in our opinion, its provision is vital to their contentment.

In the geographical conditions of India, and in view of the increasing Indianisation of the Services, including the Medical, the adequate provision of qualified British medical attendance for the British members of the Services presents peculiar difficulties. The following solutions, based on the evidence laid before the Commission, appear to us to be the most practicable and we recommend them for adoption :—

(*a*) The districts of a Province should be grouped, and a British medical officer (civil or military) should always be posted to one station in each group. This station should be within easy reach of each district in the group. The details of this grouping should be arranged by the Local Governments concerned, in consultation with the Government of India, and should be subject to the approval of the Secretary of State.

(*b*) In stations where there is no British medical officer, travelling allowances for the officer or his family should be granted to and from the nearest station where there is such medical officer. Payment should be made on a certificate by the medical officer, countersigned, if desirable, by the head of the Medical Service in the Province. Alternatively, if more convenient or if the patient is not fit to travel, the expenses of the medical officer's visit (exclusive of his normal fee for attendance) should be defrayed by Government.

(*c*) In the event of a case being of such a serious or special nature that the doctor first consulted does not feel able or willing to treat it, he may give a certificate authorising the patient to travel to the nearest station where adequate