

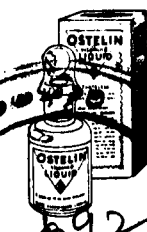
MEDICO-SURGICAL SUGGESTIONS

Vol. V.

MAY

No. 5.

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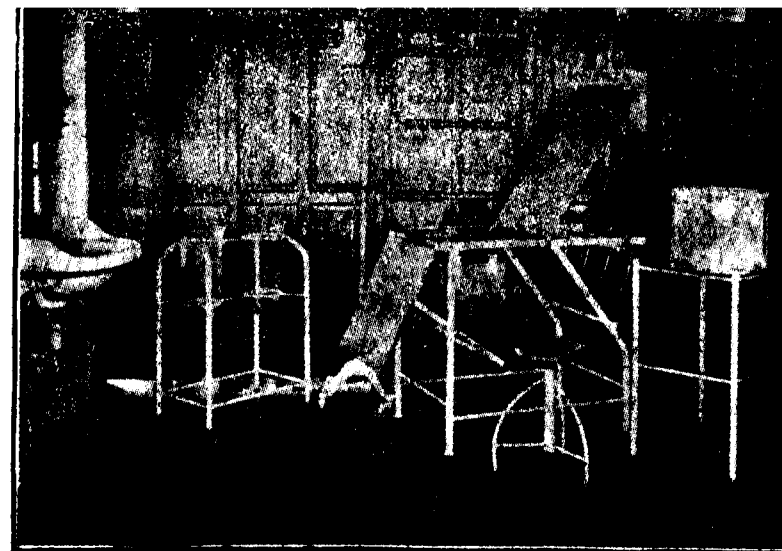
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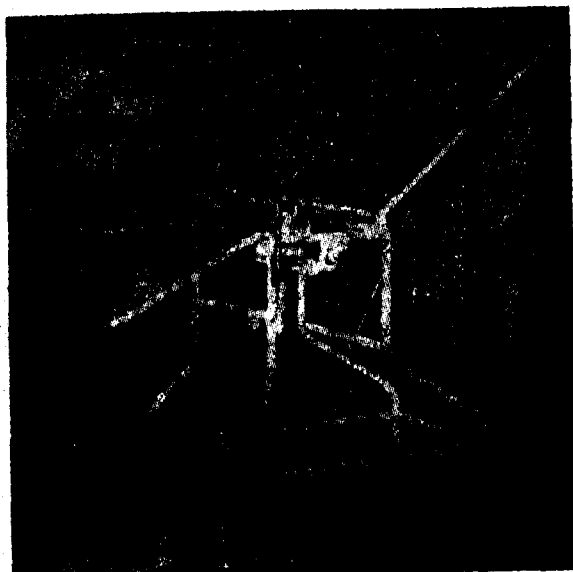
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MEDICO-SURGICAL SUGGESTIONS

A MONTHLY JOURNAL OF PRACTICAL MEDICINE & SURGERY

VOL. V

MAY 1936

No. 5

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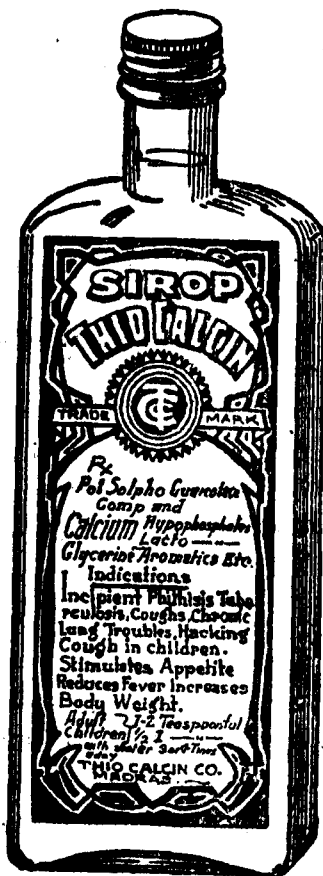
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Leading Articles PLAGUE

BY CAPT. B. DAYANANDA RAO, L.M.S., (MAD.) L.R.C.P.S. (EDIN.)
D.T.M. (L'POOL) L.M. (ROT.)

Assistant District Medical Officer, Bellary.

This paper is not meant to be an exhaustive thesis on Plague, but I will try as far as possible to bring before you a few salient factors regarding plague in general with special reference to the epidemic at Bellary.

Definition:—Plague is a specific communicable epidemic, common to man and many other lower animals, characterised by fever, adenitis, a high rate of mortality; accompanied by the presence of a specific bacillus, namely *Bacillus Pestis*, in the blood and glands.

History:—There is, I believe, some reference about Plague in the Bible, and it was also known to ancient India. However the first authentic account of plague was in 542 A.D. when it occurred as an epidemic in Egypt and the Roman Empire and a very severe epidemic occurred in London somewhere in 1665 A.D. It was first imported into India from Hong-kong in 1896 and since then it breaks into epidemic form periodically in various parts of India.

Etiology:—The specific organism of plague was discovered by Kitasato and Yersin in 1894. The plague bacillus—*Bacillus Pestis*—as seen in blood and other tissues is a short thick bacillus about 2μ long and 0.5μ broad, stained readily by any aniline dye, the extremities taking a deeper stain, thus giving it the characteristic bipolar appearance. It is easily cultivable in blood serum and agar, but does not produce spores. If the culture is injected into man or lower animals, characteristic signs of plague appear. The main vector in plague is the rat-flea. The disease is not communicable by simple contact, e.g., if a plague rat is deprived of all the fleas and put into a cage with other healthy rats without fleas, no plague occurs among the healthy rats. On the other hand if a plague rat with

fleas is put into a cage with other healthy rats, the rats contract plague and die. The most important types of fleas that infest rats are *Xenopsylla Cheopis* and *Xenopsylla Astia*. Of these *X. Cheopis* is the more dangerous. *X. Astia* is not able to convey plague infection as effectively as *X. Cheopis* as *X. Astia* bites man with reluctance. That is why it is presumed that wherever the *X. Astia* variety of fleas infest rats (e.g. in Madras) there are no plague epidemics. *Bacillus pestis* multiplies itself in the stomach of the flea and can retain its virulence for 20 days. The average life of a flea separated from its host is about 10 days but under special circumstances can remain alive for two months. The two important varieties of rats which take part in the spread of infection are the common rats, *Rattus Norvegicus*, the grey rat, and the *Rattus Rattus*, the black rat. The rats is plague infected places acquire a certain amount of immunity from plague, e.g. if 100 rats from Madras and 100 from Bellary are injected with the same amount of virus, there will be 100 per cent mortality among Madras rats and probably 60 to 70 per cent among the local rats. In certain rats the disease may assume a chronic form and these are the rats that keep up the yearly recurrence of the epidemic.

The *Modus Operandi* in a plague epidemic is I think somewhat like this. An old rat with chronic plague dies. The infected fleas leave the rat and settle on other fresh young rats. These rats die leaving more fleas to attack more rats. There is an epidemic of plague among rats. The rats instinctively run away carrying infection all round. When a large number of rats die, the hungry fleas who cannot find rats to feed upon, attack human beings and thus plague epidemic in men starts usually from 10 to 15 days after rat falls. Another interesting experiment is worth mentioning. The fleas are only capable of jumping 4 inches from the ground. Healthy guineapigs kept 2 feet above the ground where there are plague infected fleas do not contract plague, but they do contract if kept 2 inches above the ground.

When the flea bites, the plague bacilli are injected

- (1) by the dejecta of the flea deposited very near the place bitten
- (2) bacilli are injected in the act of biting
- (3) some blood from the oesophagus is regurgitated into the wound during bite.

It might also be due to the bitten man scratching the place bitten and rubbing the dejecta in the fresh wound made by the bite. Children below 2 years do not do this, and it might be that although children below 2 years are more exposed to flea bites, the incidence of plague is less among them.

Symptoms.—The incubation period of plague is about 3 days. The disease sets in suddenly with fever, headache, lassitude and nervous symptoms predominate quite early in the disease. The face assumes a peculiar expression, features are drawn, eyes blood shot,

and sunken. The patient wears an expression of fear, has an unstable gait like a drunken man, and a stammering speech. There may be vomiting. The fever rises to 103 or 104 degrees, prostration is marked, urine scanty, pulse at first bounding, later becomes feeble and fast. In about 70 per cent of the cases within 24 to 48 hours the glands either in the femoral, axillary or submaxillary regions become enlarged and painful. Hæmorrhages either petechial or diffuse may appear in various parts of the body. Small patches of gangrenous skin may appear. Hæmorrhage from all the natural orifices sometimes take place. Abortion invariably occurs in pregnant women. Death may take place at any time between the third and fifth day and is due to failure of the heart, convulsions, coma or internal hæmorrhage.

Septicaemic and Pneumonic plague.—This is the most dangerous variety of plague alike to patients, attendants and visitors as the sputum contains a pure culture of bacilli. There is also an intestinal variety where abdominal symptoms, such as bloody vomiting and diarrhoea predominate. The mesenteric glands are affected and the condition is usually fatal.

Diagnosis of plague is usually easy during an epidemic. After a little experience a diagnosis can usually be made from the general appearance of the patient. In places where there is Malaria and Filaria it is difficult to be accurate on the first or second day. Plague bacilli may be found in an ordinary blood-smear and if found, the cases are usually fatal. Gland puncture may reveal the bacilli. Cultural methods are more accurate and one can also study the intensity of the disease. $\frac{1}{4}$ cc. of blood from the patient is taken and cultured. If in 24 hours time less than 10 colonies grow it is classified as class C. If it is less than 100, but more than 10 colonies it is classed B, and over 100 colonies is classed A. The contents of gland puncture may also be cultured. In doubtful cases animal inoculation may be done to establish a definite diagnosis.

Mortality.—The mortality in plague differs in different places and in the same place in different epidemics. The mortality has got a natural tendency to become less at the fag-end of an epidemic. Bubonic variety which suppurates early has the least mortality, septicaemic and pneumonic the highest mortality. In Bellary there were 230 attacks with 178 deaths, a mortality of about 77.4 per cent.

Treatment is divided into prophylactic and curative. Prophylactic treatment is again divided into general and individual. The general prophylaxis in an epidemic consists chiefly of destruction of rats and fleas. The destruction of rats is done by catching with rat-traps, laying rat poison, and gassing or fumigation with sulphur dioxide. Gassing with sulphurous acid has been tried for some time in all parts of the presidency with good results. But in this connection, I think we must take a lesson from the agricultural department. In

cases where certain agricultural pests ruin the crops, spraying and destroying the pest is not considered to be the ideal method of dealing: but they cultivate and let loose certain other insects which destroy the pests and don't let them multiply. To deal with malarial mosquitoes, we do not kill individual mosquitoes but deal with mosquito larvae: certain varieties of fish are let into the stagnant pool, and the fish deal effectively with the larvae. Similarly, trying to deal effectively with the breeding of rats than destroying individual rats seems to be an ideal. During the plague epidemic of the Roman Empire in the 6th century, the Romans began to breed and domesticate snakes. Every Roman household had its own pet snake as we have pet dogs. These seem to have dealt affectively with the breeding of rats and the eventual disappearance of plague from Italy is attributed to this measure. This reminds me of the worship of snakes among the Hindus in India and I believe there might be something in this apparently bewildering sentiment—why snakes of all things should be considered sacred and worshipped. Individual prophylaxis is obtained chiefly by Plague inoculations. Haffkine's prophylactic vaccine gives the best results. In Bellary the statistics are:

Population.	Inoculated.	Attacks among the inoculated.	Attacks among the non-inoculated.
47,573	17,213	1 in 2150	1 in 237

This shows that the non-inoculated are liable to contract the disease 16 times more than the inoculated. Deaths among those attacked after inoculation is 50 per cent as against a mortality rate of 77 per cent. In the Baghdad epidemic the incidence was 1 in 3800 among the inoculated and 1 in 160 among the non-inoculated, and mortality was 24 per cent among the inoculated and 60 per cent among the non-inoculated. This conclusively proves the efficacy of protection by inoculation. The inoculation protects the individual from 6 months to 1 year.

Curative Treatment:—Plague is essentially a septicaemia and should be treated as such. Various remedies have been tried by various people with varying success, but none have proved very successful. Much of the success depends upon individual resistance of the patient, the early beginning of treatment and the virulence of the toxins. Medicinal treatment is mainly symptomatic and consists of measures to sustain the action of the heart. The chief remedies that were employed in this hospital during the present epidemic are (1) Iodine (2) Iodine plus S. U. P. 36 (3) Mercurochrome (4) Haffkine's Plague Serum (5) Bayer 205.

Iodine:— $\frac{1}{2}$ gr. iodum, 1 gr. Pot Iodide in one c. c. of distilled water is the stock solution. One c. c. of this solution is diluted in 10 c. c. of distilled water and injected intravenously daily once. One c. c. of this diluted fluid is also injected into each gland and periglandular tissue daily. This treatment is I believe widely practiced

in epidemics in India and reduces appreciably the mortality rate. In our experience the mortality rate has been reduced from 77 to 50 per cent. Out of 28 cases treated 73 were cured, 13 died and two discharged otherwise. Later on Iodine plus S. U. P. 36 in 1 c. c. doses intravenously were tried together and produced equally good results. Out of 20 cases treated 10 were cured and 10 died.

Mercurochrome:—This preparation was given a trial in 15 cases. 0.1 per cent solution in 10 to 20 c. c. of distilled water should be injected daily intravenously. This treatment is almost a specific in cases of *B. coli* infection. In our experience this drug did not work as satisfactorily as is reported in the literature. Out of 15 cases treated 11 died and 4 were cured. This treatment was given up accordingly.

Bayer 205:—Recently strong claims were put forward regarding the efficacy of this drug, one doctor in Mysore claiming as much as 80 per cent cures with this drug. This drug comes in powder ampoules of 1 gramme and we give it in two doses of 0.5 gram. each on two successive days. As we got this drug for experiment late, we could try it only in 4 cases out of which 1 was cured, 2 died and one was discharged otherwise. We cannot say anything definite about this drug until we try it on at least 20 patients. In two cases we did ordinary symptomatic treatment by medicines and no injections were given. One died and one was cured.

Serum Treatment:—The Haffkine Institute of Bombay sent a special staff to work here and try the efficacy of Haffkine Serum. Haffkine Serum has been tried in three other places and the conclusions arrived at are very encouraging. Among rats, guinea pigs and rabbits the results of serum treatment are astounding. Two c. c. of the serum was administered intramuscularly to a number of rabbits and the results are as follows:

Time of Administration of Serum after Infection.	Infected rabbits.	Mortality (percentage) within 30 days.
1 Immediately after	34	0
2 24 hours after	40	0
3 48 hours after	43	9.3
4 72 hours after	48	31.2
5 96 hours after	25	32.0
6 Controls	33	94.0

These results show two things: (1) The high efficacy of the serum in rabbits; (2) the earlier the serum is administered the better are the results.

If what is true of rabbits is true to man, we have found the most potent weapon for plague; but unfortunately it is not true. The mortality rate with serum treatment in the Hyderabad epidemic has been worked at about 35 per cent when the average epidemic mortality was some where about 70 per cent. In this connection, it would be very interesting if statistics are published as to mortality

rate classified according to the class A,B,C, about which I referred earlier and also classified as to what day of disease the treatment was started. From what I have seen of the serum if the case is class C with less than 10 colonies in $\frac{1}{4}$ c.c. of blood and serum treatment is started within 24 hours of onset of the disease, the serum treatment should produce 100 per cent of cures. In our series, out of 12 cases treated with serum 8 were cured and four died. The mortality is only 33 per cent and is the best so far obtained following any one line of treatment. Three of these cases were actually classed A, with more than 100 colonies, and recovered. These would not have had any chance with other remedies.

The serum is given in doses of 20 to 50 c.c. intravenously, slowly. Sometimes there might be an anaphylactic reaction which is easily overcome by adrenalin injection; 20 per cent. glucose solution is sometimes added to the serum if the patient's condition is low. The serum is repeated every day till the temperature comes to normal and the general condition improves. In my opinion, serum has a great future before it in the treatment of plague.

Plague cases treated, excluding admitted moribund.

Treatment.	Cured.	Died.	Discharged Otherwise.	Total.
Iodine	13	13	2	28
Iodine & S. U. P. 36	10	10	...	20
Mercurochrome	4	11	...	15
Serum	8	4	...	12
Bayer 205	1	2	1	4
Ordinary	1	1	...	2
	37	41	3	81

Plague cases treated including admitted moribund : 36.

Cured.	Died.	Discharged moribund.	Discharged otherwise.	Total.
37	68	9	3	117

Hindus.	Muham- madans.	Other castes.	Total.	Male.	Female.	Children.	Total.
85	29	3	117	45	46	26	117

[Read before the Bellary District Medical Association on the 23rd February 1935.]

From the Bellary District Medical Association, Bellary, 23rd February 1935. The following table shows the results of the treatment of plague cases in the Bellary District Medical Association, Bellary, during the year 1934. The cases were classified according to the class A, B, C, and the day of disease at the start of treatment. The results show that the mortality is only 33 per cent, which is the best so far obtained following any one line of treatment. Three of these cases were actually classed A, with more than 100 colonies, and recovered. These would not have had any chance with other remedies.

AFFECTIONS OF THE LUNGS AND PLEURA

BY DR. S. SANKARA RAMAN, M.B., B.S.

Guddalore.

(Continued from the April issue.)

TREATMENT OF PULMONARY TUBERCULOSIS.

Sanatorium treatment is the best for early cases.

Medicinal measures. Cod Liver Oil preparations or Halibut Liver Oil, Calcium either as a chloride or as a gluconate, Creosote, Hypophosphites, Sanatogen and fresh fruits are useful adjuvants but not definite cures in the treatment.

The injections of *Gold preparations*, as Sanocrysin or Solganol are useful in a limited number of cases. Begin Sanocrysin with 0.1 gm. and if there is a severe reaction, stop the treatment altogether. If a mild reaction occurs, repeat the same dose after a week, and do not increase the dose until there is no reaction. If there is no reaction, after three days give 0.25 gm. This dose should not be increased if there is a reaction; if there is no reaction, increase by 0.25 gm. at weekly intervals until 1 gm. is reached. Repeat 1 gm. three times. Do not give more than 7 gms; 4 gms. is a normal limit. Sanocrysin stimulates the natural defences of the reticulo-endothelial system so that the bacilli are rapidly phagocytosed and also stimulates the formation of new connective tissue. The most striking effect of Sanocrysin is to reduce the quantity of sputum, and to free it from tubercle bacilli. Temperature is reduced.

Complications from Sanocrysin : (1) dermatitis, (2) gastro-intestinal irritation, (3) albuminuria.

Contra-indications: (1) fibroid phthisis, (2) gastro-intestinal diseases, (3) marked toxemia, (4) renal disease, and (5) systemic disease as diabetes.

Sanocrysin is very useful in early exudative type of tuberculosis, recognised on the X-ray film by the fluffy, wool-like appearance of the areas of density scattered through both lungs.

For the night sweats of phthisis, acetylcholine is a useful remedy. Two cgm. of the drug dissolved in 5 cc. of distilled water is injected subcutaneously; usually two doses are sufficient.

Collapso Therapy is useful in cases—

- (1) where the disease is slowly progressing and is strictly unilateral, and the process of fibrosis and contraction predominates over those of caseation and softening;
- (2) in hæmoptysis cases, as a deliberate treatment when there is repeated hæmorrhage, or as an emergency measure in severe hæmoptysis endangering life;

- (3) in cases where partial arrest has been achieved by ordinary medical measures but the patient is coughing and expectorating still;
- (4) cases with predominantly basic signs in which phrenic avulsion has failed to secure arrest;
- (5) where spontaneous pneumothorax occurs and its continuation by artificial re-fills are indicated.

Artificial Pneumothorax is unsuitable with—

- (1) cases in which the other lung is involved
- (2) where there are pleural adhesions
- (3) severe tubercular enteritis
- (4) renal tuberculosis
- (5) patients with poor physique and marked dyspnoea
- (6) cardio-vascular disease
- (7) chronic nephritis and
- (8) asthma or advanced emphysema.

Thoroceplasty is suitable in cases—

- (1) where successful artificial pneumothorax has been allowed to terminate with a recurrence of symptoms and re-collapse is not possible;
- (2) where an artificial pneumothorax is imperatively indicated in a case of progressive unilateral disease, yet because of adhesions it is not possible to induce one;
- (3) where a tubercular empyema is present.

It is unsuitable in (1) active disease in the other lung; (2) poor resistance; (3) fibroid phthisis; (4) cases with amyloid disease or tubercular enteritis of a severe degree.

Phrenic Avulsion is performed to produce basal collapse.

Whether these serious operations can be undertaken in an individual weakened by disease and depressed in mind, and in places where there are not adequate facilities is a question which has to be considered.

PLEURISY.

Whether dry or with effusion, pleurisy has many causes. Primary pleurisy is due invariably to tuberculosis, and to a less extent to rheumatism. Secondary pleurisy is due to tuberculosis, lobar pneumonia, pulmonary collapse, interstitial pulmonary fibrosis, bronchiectasis, abscess, gangrene, infarcts, new growths of the lung. It is also due to generalised infections as the enteric group, septicaemia, influenza, severe anaemias, leukaemia, chronic nephritis and injuries of the chest wall.

Symptoms: Initial stitch-like pain and rigor are followed by dry cough; effusion relieves the pain. Patient lies on the affected side usually, but may lie on the sound side also. Chest movement is restricted in the lower part of the chest on the affected side, cardiac impulse is displaced away from the side of fluid, vocal fremitus

is diminished or completely absent, percussion is stony dull, upper level of fluid assumes a S-shaped curve of Ellis with the patient sitting up. The area of gastric resonance, known as Traube's space, is encroached on or obliterated according to the extent of effusion. The relaxed lung above the effusion gives a skodaic note in front, and at the back there is a triangular area of moderate dullness above the stony dull area of fluid, known as Garland's triangle, corresponding with the relaxed lung. At the extreme base on the contra-lateral side there is a small area of dullness known as Grocco's triangle, with the apex at the vertebral column about the upper level of the effusion due to mediastinal displacement. The breath sounds are absent usually, but when there is marked collapse of the lung and patent bronchi, bronchial breathing can be heard. Vocal resonance is absent over the effusion but just above the effusion, aegophony is heard. Bacelli's sign differentiates between a serous and a purulent effusion in that the whispered voice is conducted through the former and not through the latter, but it is not a reliable sign. Pressure on the descending aorta may cause lowering of blood-pressure in the leg as compared with that in the arm.

Treatment: Relief of pain can be obtained by an antiphlogistic application or a belladonna plaster. Strapping of the chest in a position of full expiration, binding the hemi-thorax from spine to sternum with Leukoplast strappings is usually advocated. Aspirin or morphia may be necessary in some cases.

Rest in bed for a fortnight at least after all symptoms have disappeared is absolutely necessary.

Exploratory puncture is necessary to make sure that the effusion is clear and not purulent. The site chosen is the fifth space in the mid-axillary line, seventh space in posterior axillary or just below the angle of the scapula behind.

When to tap: To tap or not to tap is the question. Tap—

- (1) if the effusion is causing distress, cyanosis or dyspnoea;
- (2) if great displacement of the mediastinum is present;
- (3) if the effusion will not absorb within three to four weeks;
- (4) if it increases progressively under treatment;
- (5) if it keeps up the temperature;
- (6) if there are tubercle bacilli present in the sputum and artificial pneumothorax is indicated;
- (7) if acute oedema with albuminous expectoration occurs;
- (8) in case of bilateral effusion with increasing dyspnoea the larger effusion may be aspirated.

The dangers of paracentesis are:

- (1) cough and pain;
- (2) dyspnoea;
- (3) haemoptysis;
- (4) acute oedema of the lungs;
- (5) syncope and sudden death.

The simplest method is ordinary syphonage. The needle is put into the chest with a tube attached and the distal end of the tube is placed under the fluid in a bottle.

Negative pressure aspiration: Potain's apparatus and Dieulafoy's apparatus are used.

Replacement by air or oxygen: The fluid, instead of being drawn off by the force of gravity or aspiration, is replaced by sterile air or oxygen, so that a pneumothorax is produced which soon gets absorbed resulting in a steady traction on the lung which is consequently not put to any strain by negative pressure.

Diuretics like Salyrgan only act as purgatives and diaphoretics and are ineffective in removing the fluid.

(To be continued)

Selected Articles

WHAT SHALL WE DO WITH THE UNHEALTHY CERVIX?

BY G. H. GARDNER, A. B., M.D., F.A.C.S.

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For years it has been recognised that cancer of the uterus is one of the most frequently encountered malignant tumors, and that cancer of the cervix is far more common than cancer of the fundus. Consequently cancer of the cervix uteri occupies a prominent and unenviable position among the diseases of women. Since the actual cause of cervical carcinoma is unknown its inception cannot be prevented, but there is a great opportunity to materially increase the number of cures from cancer, if patients could be obtained for treatment when the growth is small, while it is localized in the cervix and is amenable to complete eradication by the therapeutic methods now at our disposal.

Laymen of our generation are vitally interested in preventive medicine and they are rapidly being educated to the value of periodic physical examinations. Such regular visits to the doctor will lead to the recognition of many diseases while they are still in an incipient stage. Numerous gynecologists have urged semi-annual pelvic examinations, especially for women who have borne children; by this expedient they hope to discover early cancers of the cervix before symptoms occur, and while the growth is in such an early stage that it can almost certainly be cured.

However there are several obstacles to be overcome. In the first place, one has to urge physicians to make vaginal examinations and to inspect the cervix, as an integral part of the complete physical examination of every woman. If these genital examinations are made routinely, it is inevitable that many unhealthy cervixes will be found; some will be cancers, others, benign. Some will need treatment, others can be kept under observation.

Some writers would have us believe that cancer of the cervix can be prevented by treating every unhealthy cervix, i.e. by eradicating diseased areas, either through topical applications of various antiseptics, by cauterization with the electric cautery, or by surgical excision. Repair of the badly diseased cervix probably is valuable prophylaxis against cervical cancer but indiscriminate cervical operations are not recommended and should be discouraged.

In recent years the gynecological literature has contained many reports on the value of the colposcope and the Schiller test in the early recognition of cervical cancer. The colposcope was designed for minute inspection of the cervix; it supplies ideal illumination and magnifies the areas under consideration at least 8 or 10 diameters. Gynecologists skilled in its use are able to detect tiny areas of leukoplakia and cancers which are not visible to the naked eye; however, the colposcope is an expensive instrument and few men are sufficiently experienced and skilled in its use to allow them to intelligently interpret the pathology which they are able to see. The Schiller test consists of an application of Gram's solution to the vaginal portion of the cervix. Due to the glycogen content of surface epithelial cells, the *pars vaginalis* of the cervix stains brown when treated with this iodine solution and early cancers fail to take the stain. However, erosions stain faintly and are pink; ulcers and eversion do not stain at all; some areas of chronic cervicitis stain only faintly; trauma may destroy the surface glycogen-bearing cells so that staining does not occur; granulations are not stained and in prolapsus staining is prevented by hyperkeratosis. Consequently the Schiller test merely aids in the detection of abnormal areas on the cervix; it does not differentiate benign from malignant lesions.

Possibly I am ultraconservative but I can not be enthusiastic about new procedures which have not yet proven their worth. In all fairness, however, it must be said that both the Schiller test and the colposcope are extremely valuable; if for no other reason, simply because they encourage careful study of the uterine cervix.

I wish to direct attention to the gross appearance and physical characteristics of several common lesions of the cervix, and to comment on the symptoms which they produce and the indications for their treatment.

Nulliparous erosion: Erosions are often confused with cancer.

An erosion of the cervix is usually symmetrical. It is centered about the external os and involves both lips almost to the same degree. It is not an ulcer, nor is it a depressed lesion with loss of substance. It is composed of granulations and consequently is pink or red in color. It is only slightly raised above the level of the external cervix and frequently is not suspected on palpation although it is quite evident when the cervix is inspected. Its margins are smooth and are sharply demarcated. It may ooze modestly when traumatized with

cotton, especially if it contains polypoid granulations. It is often an unsuspected finding in a patient without pelvic complaints, although it also may be the source of an annoying leucorrhœal discharge.

Erosions are complications of endocervicitis and probably arise from the digestive action of cervical discharges on the epithelium which covers the external cervix. Granulation tissue replaces the destroyed epithelium.

Most nulliparous erosions need no treatment. Those which are attended by annoying leucorrhœa may be eradicated by endocervical cautery plus punctuate local destruction of the eroded surfaces. A few may be so extensive that amputation is advisable.

In contrast with cancer, erosions are firm, not friable. They give rise to slight spotting or streaking of blood when harshly traumatized; there is no free bleeding. It is thought that cancer of the cervix does not develop from erosions but may arise at their margins, i.e. at the junction of granulation tissue with the vaginal epithelium.

If one is in doubt and fears that an eroded or everted cervix also contains cancer, I advise amputation in preference to removal of a fragment for biopsy. Amputation is preferable because it removes the pathology, its end-result is a smooth healthy cervix and all of the suspected lesion is then available for careful microscopic study.

Lacerations with eversion: The cervix may be split so extensively that it is obviously divided into an anterior and a posterior lip; the endocervix is exposed and its mucosa frequently rolls out, pours out or everts on the torn surfaces as reddened granulation tissue, called an eversion. With the exposure of the endocervix, infection is inevitable and endocervicitis results. Such lacerations with eversion frequently give rise to considerable leucorrhœal discharge. There may be slight spotting bleeding, not hæmorrhages.

The laceration is easily palpated but the extent of the inflammatory process is revealed best by inspection.

Whether or not such a cervix should be treated, depends entirely on the symptoms which it produces. For less extensive lesions, cautery treatments may suffice; however, if the lesion is marked it is useless to try to cure it with any treatment short of surgical excision. Whether an operation should be performed, or the cervix kept under observation, may depend upon the patient's wishes about future pregnancies; a cervix which is already lacerated will undoubtedly be appreciably shortened by corrective surgical procedures.

Although these unhealthy, lacerated, eroded and everted cervixes are a menace and must be watched carefully, there is little reason to believe that the cervix is often the focus of infection responsible for systemic disease.

Cervical Polypi: Cervical polypi probably are not true tumors, they are merely finger-like prolongations of granulation tissue from the endocervix. In other words, the presence of a cervical polyp

means that there is also an inflammation of the cervical canal. Cervical polypi frequently give rise to a slightly bloody vaginal discharge, but are never responsible for free bleeding or hæmorrhages.

Polypi are elusive on palpation. Frequently they are so small that they cannot be felt; often-times they are so soft that they make no impression on the examining finger. On inspection they are easily recognized; they protrude from the external os, arise in the cervical canal, are red or gray in colour and are usually multiple. They vary in size from minute granules to prolongations 3 or 4 inches in length, and a half-inch in diameter. They may be confused with polypoid masses of endocervical or uterine cancer, presenting at the external os or protruding into the vagina.

Due to the possibility of such confusion and because polyps are responsible for some symptoms, we recommend their routine removal, but not as an office procedure. The patient is hospitalized and under anaesthesia the polyps are removed; the cervical canal is thoroughly dilated, the uterine cavity is curetted and the associated endocervicitis is treated, usually by cauterization. The removed tissues, both polyps and curettings, are sectioned and studied histologically; an occasional cancer is found.

The type of treatment just recommended is not conducive to a recurrence of polyps; yet it has been taught for years that recurrence is characteristic. Of course they will recur, if the underlying pathology responsible for their development is not corrected.

Polypoid Fibroids: A submucous uterine fibroid with an attenuated pedicle which permits it to present in the cervical canal or protrude into the vagina, is called a polypoid fibroid. It is usually associated with gushing menstrual bleeding and intermenstrual bloody discharge. Such tumours are infected; because of their presence, the cervix is patulous and the uterine cavity also is invariably infected.

Polypoid fibroids are firm, rounded tumors; sometimes a pedicle can be felt extending into the uterus. The cervix is usually softened, it may be effaced and almost imperceptible. These tumors vary in size from a small button to those which weigh several pounds. Sometimes necrotic polypoid fibroids are difficult to differentiate from a large cauliflower carcinoma of the cervix. Fibroids which become polypoid after the menopause are almost invariably sarcomatous.

Polypoid fibroids should be removed vaginally; if there are other fibroids in the uterus which make hysterectomy advisable, the abdominal operation should be postponed for a month; this permits the infection of the uterus to subside, or disappear. Waiting for a month, after a vaginal myomectomy, before entering the abdomen will greatly reduce the incidence of postoperative infections.

Cancer of the Cervix: If one is careful in eliciting histories, is accurate in making vaginal examinations and inspects the cervix under ideal illumination, he will diagnose correctly 98% of the

cancers of the cervix which come into his office; only a few will require biopsy, although a diagnosis of cancer should always be confirmed by microscopic study.

Vaginal bleeding, after the "change of life," denotes cancer until some other cause is definitely proven. Bleeding between the menstrual periods also, may be due to cancer and its cause must be accurately determined. The earliest symptom, noted by most women with cancer of the cervix, is bleeding after sexual intercourse. Foul vaginal discharge appears in the later stages and pain occurs only when the cancer is too far advanced to be cured.

Most cancers involve more than half of the cervix when they first give rise to symptoms. They are friable tumorous new-growths which bleed freely on manipulation, which crumble easily when palpated with a curette and which rarely cause an enlargement of the cervix to more than twice its normal size. In later stages, the friable tissue may be replaced by a craterous ulcer with indurated margins. In earlier stages friability, not stony hardness, is the characteristic finding on palpation.

Cervical Cautery: Endocervical cauterization should extend from the internal os to the external os, in the form of three to five narrow linear longitudinal cuts or burns. Their purpose is to establish free drainage, open infected crypts and overcome obstructions; one must avoid complete destruction of the endocervical mucosa for fear of producing cervical strictures.

The improvement after cervical cauterization does not begin for a month; during the first three weeks the leucorrhoeal discharge is increased and there may be bleeding, even hæmorrhages; but the improvement continues over a period of many months and consequently the cervix need not be recauterized until at least a year has elapsed.

Patients who have been subjected to cervical cauterization must be examined regularly and the cervical canal tested, to be sure that it remains adequately patent.

Experience has proven to us that retrodisplacement of the uterus predisposes to the development of pelvic infections after cautery treatments; they are of sufficient frequency to make retroflexion of the uterus a contraindication to the use of the cervical cautery.

Modified Schroeder Amputation of the Cervix: When surgical correction of a lacerated, everted or eroded cervix is indicated, we prefer a modified Schroeder amputation. Such an operation removes the diseased cervical tissues and carefully maintains an adequate cervical canal. It is easily performed; it is a rational procedure and has proven ideal in our experience. It is rarely followed by cervical strictures, although obstructive lesions are common after most cervix operations. Furthermore, the modified Schroeder amputation is compatible with future child-bearing.

Radium Treatment: Only the earliest, Stage 1, cancers of the cervix are amenable to surgical excision. Few gynecologists see enough of these lesions to become proficient in the technique of the radical operation for cancer of the cervix. Consequently radium treatment has become the therapy of choice, and the mortality and morbidity following radium treatment is much lower than after operation.

A suitable type of therapy includes the insertion of a palisade of radium needles around the cervix and into the parametria outside the apparent margins of the cancer, along with a chain tandem bolus of radium in the cervical canal and uterine cavity. With such technique, cancerous tissues are subjected to a cross-fire of radiation; in favorable cases, they can be completely and permanently destroyed.

CONCLUSIONS.

1. The laity should be educated to the value of periodic physical examinations.
2. Physical examinations of women are not complete unless they include palpation of the genital organs and inspection of the cervix.
3. The ideal management of cervical polypi includes, besides their removal, dilatation of the cervix, curettage of the uterus and eradication of the associated endocervicitis.
4. Few erosions and lacerations with eversion require treatment; most of them can be kept under observation.
5. Erosions and eversions may be responsible for a leucorrhoeal discharge, never for vaginal hæmorrhages.
6. Cancer of the external cervix is characterized by friable tissue which bleeds freely on manipulation.
7. Modified Schroeder amputation of an unhealthy cervix, suspected also of containing cancer, is preferable to removal of a fragment for biopsy.
8. Following all operative manipulations on the cervix, the patient must be instructed to report for examination regularly so that the patency of the canal can be maintained and cervical strictures prevented.

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CONSERVATIVE TREATMENT OF THE PHARYNX

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Observing clinicians, since medical history is recorded, have considered the mouth and pharynx "the mirror of the body." Clinical medicine and research are constantly corroborating the observation that most pharyngeal pathology is secondary to disease in the nose and sinuses, the lower respiratory tract, or to some general systemic disturbance.

Pharyngeal diseases from a consideration of management and treatment may be classified as:

1. Primary infections implanted upon the pharyngeal mucosa by air or food borne organisms.
2. Pathology due to continued infection in the nose or lower respiratory tract or in the lymphoid or glandular structures in the pharynx itself.
3. Noninfectious irritants.
4. Pharyngeal manifestations of general alterations or diseases.
5. New growths.

When considering treatment, the nasopharynx, the oropharynx, and the hypopharynx must, to some extent, be considered as distinct entities, since they differ in anatomy and function.

The nasopharynx is essentially a part of the nose, being lined by the same ciliated, mucous covered membrane, which must always be respected. It contains structures of distinct importance, such as the pharyngeal end of the eustachian tube and the adenoid. Its function is to convey air, supplement the local defense mechanism of the nose proper, permit aeration and drainage of the ear cavities and, by its musculature provide a barrier between the nose and pharynx proper. The wall of the nasopharynx being placed at almost right angles to the nose, is subjected to maximum trauma from air currents and irritating substances in the inspired air. Because of natural architecture, nasal discharge is also directed into the nasopharynx, frequently with continued infection or irritation. The adenoid tissue, usually the first part of the pharyngeal lymphoid ring to become an active offender from chronic infection or hypertrophy, may continue infection or obstruction or, by adherence of its lobes, provide the necessary cavity for a Thronwald's abscess.

The above recital of architecture and responsibilities of the nasopharynx is made to emphasize the importance of an area which too often is grossly and radically treated by the application of toxic, irritating drugs or permanently damaged by careless removal of adenoid tissue.

The oropharynx, highly vascularized and enervated, is assigned the double duty of transmitting air and food. It is subjected to infections and trauma by way of the mouth, as well as from the nose and nasopharynx. It is lined by nonciliated squamous type epithelium, which permits of certain therapeutic liberties, not applicable to the nasopharynx. The oropharynx contains the faucial tonsils, which are usually the second part of the lymphoid ring to lose their usefulness in a breakdown of pharyngeal lymphoid defense. It also contains innumerable lymph nodes and glands, which may become hypertrophied or infected.

The hypopharynx assumes the highly specialized function of diverting food into the squamous cell lined esophagus, and air into the trachea, with its columnar ciliated epithelial lining. The structures of greatest importance in this region, from the standpoint of treatment, are the larynx and the tonsillar portion of the lymphoid ring.

Acute pharyngeal infections, resulting from an overpowering of the local and general defense by a virulent organism, whether it be a so-called cold infection, influenza, a milk-borne streptococcus or one of the acute exanthemata, is largely a matter of intensive general treatment. The extreme vascularity of the pharyngeal walls favour rapid absorption of toxic material, and the great number of mucous glands and lymphoid tissue in the pharynx, if involved, tend to increase and continue the toxemia. Complete rest with proper elimination and supportive treatment is of major importance. Local treatment, while of secondary importance, can assist in limiting the infection and adds comfort to the patient. Local treatment is of value, both from the point of bacterial destruction and symptomatic relief.

The nasopharynx is usually the first portion involved in air-borne infections, and is least amenable to local treatment in the acute stage, since the same anatomic defence mechanism must be conserved as in the nose. The application of toxic or irritating drugs to this area in acute infections, with their resulting reaction, depresses the local defence and may easily extend the infection into the eustachian tubes and middle ear.

Local treatment of acute infections in the oropharynx is more conducive to good results, with less likelihood of interfering with the local defence mechanism. It has in the past been the custom, however, to use drugs of a caustic nature as bactericides, such as strong silver solutions, iodine, etc. This practice cannot be supported either theoretically or in practice in the light of our present knowledge of tissue defence. The use of noncorrosive bactericides, if used frequently as hot gargles, is probably beneficial. These, however, must be used at frequent intervals to provide the bactericidal effect as continuously as possible, and doubtless the heat is as

effective as the bactericide. The use of weak phenol solutions of noncoagulating dilution is antiseptic and adds much to the patient's comfort by their local anaesthetic effect. As a local application, all the known antiseptics have been used, which in itself is an admission that none are entirely satisfactory. One of the most effective agents for application to an acutely inflamed oropharynx is a 5 to 10 per cent solution of guaiacol in glycerine. In addition to being an effective antiseptic, guaiacol produces a pleasing anaesthetic effect in the throat for a considerable length of time, although its immediate effect is a distinct burning sensation. When applied to a mucous membrane, this mixture is retained for a prolonged period to continue its bactericidal effect.

Acute laryngeal infections also must be treated with due consideration of the existing anatomy. The tendency for oedema to occur in the laryngeal mucosa, following acute pyogenic infections, make attempts at its prevention of first importance. This can best be done by absolute voice rest, the use of drugs for mild, general and tracheal sedation, the avoidance of irritating drugs in the larynx, and the use of massive cold applications over the larynx. Marked oedema of the larynx from pyogenic infection is not infrequent in children, often to the point of dangerous asphyxia. When dangerous asphyxia is imminent, the logical procedure is low tracheotomy to prevent general exhaustion and fluid accumulation in the lung spaces. Intubation or bronchoscopy in these cases produces a high percentage of laryngeal strictures.

Chronic pharyngeal pathology, such as chronic infective pharyngitis, pharyngitis sicca and chronic laryngitis are purely symptoms, the various causes of which must be ascertained and eliminated if possible. Probably the most frequent cause is chronic nasal and sinus disease, with recurrent or continued infections in the numerous mucous glands and lymph follicles in the pharyngeal wall. Local treatment indicated in these conditions is mild stimulation of the mucous glands. This is best accomplished in the pharynx by silver nitrate in 2 to 5 per cent solutions. In chronic laryngitis, the instillation of 3 per cent creosote in olive oil is particularly effective. Occasionally the mucous glands and small lymph follicles of the pharynx become chronically infected, hypertrophy takes place, and these remain as continued sources of irritation after the nasal or other primary infection is removed. Surprisingly few of these remain, however, if all nasal or other factors are eliminated so that conservatism calls for repeated search for etiologic factors. If these cannot be found, destruction of the infected glands or lymph nodes are necessary by surgical removal, careful cauterization with chemicals or by electrocoagulation.

Pharyngeal pathology, due to infection in the lymphoid structures in the pharynx, is a subject of major importance in this

discussion, as it is concerned with the tonsil and adenoid problem. Acute infections in the tonsils and adenoid are essentially a condition requiring general treatment, with local attention, as described for an acute infectious pharyngitis. It is not a conservative or logical act to traumatize an acute or chronically infected mass of lymphoid tissue by attempts at curettage or suction of the tonsil crypts. If a distinct abscess is present, free incision is indicated for drainage.

X-ray irradiation of some chronic pharyngeal diseases has an important place in therapy. Its value in the treatment of infected lymphoid structures is to reduce the amount of lymphoid tissue and facilitate drainage from unclosed crypts. It is valuable as an aid in the occasional case where surgery may be contraindicated, but it does not entirely eliminate infection. Irradiation is particularly valuable in some chronic pharyngeal infections, such as carriers of diphtheria, Vincent's or actinomycosis.

Regarding the local or conservative attitude toward the removal of lymphoid tissue from the pharynx. In spite of the fact that the adenoid and tonsils are apparently not true lymph glands, there is evidence that when in a reasonably healthy condition they act as part of the first line of defence in the early years, when the individual is building a general defence against the common infections. There can be no logical argument in favour of tonsil and adenoid removal except that they have not only lost their defensive power but actually harbour infection, which is being disseminated, or they are sufficiently hypertrophied to produce obstruction. Hypertrophy of a tonsil and adenoid may be either the result of infection or of a systemic glandular or chemical dyscrasia, which should be determined and corrected. When evidence accumulates that these structures have been overwhelmed, as complete a surgical removal as possible is the method of conservatism.

The adenoid is the earliest and most serious offender in younger children, and its removal, without permanent damage to the nasopharynx, is a difficult procedure. Conservation of the basal portion of the pharyngeal mucosa underlying the adenoid tissue is essential to prevent scar formation and an irritable nasopharynx in the future.

Conservative treatment of chronically diseased tonsils calls for complete surgical extirpation, as against electrosurgery, because of its higher percentage of complete removal and satisfactory results.

Specific infectious diseases, common to the pharynx and larynx, are tuberculosis, syphilis, Vincent's infections and, in certain sections, actinomycosis.

Tuberculous infections in the pharyngeal wall or in the larynx are best treated locally by electrosurgery, either by removal of granuloma or surface cautery on the walls of the pharynx or multiple stab puncture in the larynx. The varied therapeutic agents, such as chaulmoogra oil, acids heliotherapy, etc., used locally in these

infections, have not proved of sufficient value to consider their use as conservative.

Syphilitic lesions of the larynx are only local manifestations of a general disease and must be treated in a general way.

Vincent's infections in the pharynx can, in the majority of instances, be eliminated by frequent application of sodium perborate to the infected area. If, however, the infection is severe or inaccessible, one should resort at once to moderate doses of arsphenamine intravenously. The local application of this drug is of exceedingly doubtful value.

Noninfectious irritants of any nature, the most common being tobacco smoke, are a source of irritation to the pharynx in certain individuals. This can be demonstrated by observing an irritable pharynx with a cough subside after smoking is eliminated. Elimination of smoke as an irritant is a valuable but little used therapeutic procedure in pharyngeal diseases. The addition of cooling drugs to cigarettes, in the light of recent investigations of the effect of menthol on the respiratory mucosa, indicates further irritation from these.

We must not overlook the fact that many of the chronic pharynges, especially of the irritable congestive type, often with great quantities of mucus secretion, is merely a superficial reaction of an altered general chemistry or the result of vascular disease, where circulatory power is impaired. The much discussed mucous membrane changes in the nose, due to altered general processes, have an older counterpart in the so-called rheumatic or gouty throat of the past and is deserving of constant thought in attempting to diagnose and treat pharyngeal diseases.

Recent developments in the treatment of malignancies in the pharynx, based upon the pathologic picture present, have added much to conservatism and offer greater possibilities of a cure. Every pharyngeal growth observed demands immediate biopsy, as early diagnosis is the essence of conservatism. Irradiation of a malignancy, for limitation before biopsy or any surgical procedure, would be ideal. This is not practical as a routine, but should be practiced in all highly suspicious cases. The present day classifications of carcinoma cannot be accepted as a positive indication of radiosensitivity but, generally speaking, the epithelial growths classified as type one and two cell construction are not radiosensitive, and conservatively demand wide surgical removal with irradiation following for its limited effect. Carcinomas classified as type three and four are apt to be more radiosensitive. To this latter group also may be added sarcoma and lymphoepithelioma. These tumours are best treated by prolonged fractional irradiation to a saturation point, combining both X-ray and radium. If, however, massive growths are present, their removal facilitates irradiation. Conservative management of laryngeal

malignancies calls for the same type of prolonged fractional irradiation as the pharyngeal malignancies, but is demanding more than ever early open operation for complete surgical removal rather than by endoscopy.

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INTRATRACHEAL ANÆSTHESIA

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Magill's method of intratracheal anæsthesia has proved to be a very useful and valuable adjunct in the field of general anæsthesia, since the maintenance of an adequate airway is of great advantage in the administration of any anæsthetic gas.

The indications for the use of this technic are many, probably the most common being when it is necessary for the anæsthetist to be out of the operative field, such as during operations on the mouth, nose, pharynx, or sinuses. Obviously for any procedure requiring quiet respiration, such as upper abdominal and thoracic operations, this method of intratracheal anæsthesia is satisfactory, and from a mechanical standpoint it is a favourite at the Clinic for neurosurgical procedures in which the patient is in the prone position with his head down. It can be used in such cases both to maintain anæsthesia and an adequate airway, if necessary, for artificial respiration. Once the intratracheal tube is securely in position, positive pressure can be exerted on the lungs by various means at any time.

PRE-OPERATIVE PREPARATION OF PATIENT.

It has been the custom to administer to the average adult patient on the evening before operation $1\frac{1}{2}$ to 3 grains (0.1 to 0.2 gm.) of pentobarbital sodium. On the morning of operation this drug is given again about forty-five minutes to an hour before operation; in addition, $\frac{1}{6}$ to $\frac{1}{4}$ grain (0.01 to 0.016 gm.) of morphine sulphate and $\frac{1}{150}$ grain (0.0004 gm.) of atropine sulphate are given hypodermically. The dose of barbiturate should be sufficient to allay fear or apprehension as much as possible without at the same time depressing respiration.

It is well to spray the throat by way of the nostrils with a 10 per cent solution of cocaine or 5 per cent solution of butyn just before administering the general anæsthetic, since this will reduce the activity of the pharyngeal and laryngeal reflexes. A nasal atomizer with an olive-shaped tip that will fit the nostrils properly is used. When the tip of the atomizer has been inserted in the nostril while the patient is supine, the atomizer is held at almost right angles to the face for spraying; this allows the anæsthetic agent to be easily inhaled to the region of the oropharynx, nasopharynx, and glottis. By instructing the patient to inhale as the solution is being sprayed,

it is possible by this method to introduce sufficient anæsthetic solution locally with a few compressions of the bulb of the atomizer. This will also decrease the amount of ether necessary to produce adequate relaxation for introduction of the intratracheal tube.

TECHNIC OF INTRODUCING INTRATRACHEAL TUBE.

Induction of anæsthesia is carried out in the usual manner, using nitrous oxide, oxygen, and ether, or any of several other agents such as ethylene and ether or cyclopropane. In the average case, about 25 to 30 c.c. of ether added to the gaseous mixture is necessary to produce adequate relaxation of the vocal cords and allow easy passage of the intratracheal tube. In a few cases in which patients have a marked dislike for ether anæsthesia, we have induced anæsthesia by means of intravenous injection of a barbiturate such as sodium n-methyl-cyclohexenyl methyl malonyl urea (evipal soluble) or sodium ethyl 1-methyl butyl thiobarbituric acid (pentothal sodium). The dose used is that just sufficient to cause unconsciousness, which usually is $1\frac{1}{2}$ to 3 grains (0.1 to 0.2 gm.) At this point the needle is removed from the vein and the induction of gas-ether anæsthesia is begun in the usual manner. It has been observed in not a few cases that those who have first been given a barbiturate intravenously require less ether than those of similar habitus who have not. When surgical anæsthesia and relaxation have been obtained, the intratracheal tube may then be introduced either through the nose or mouth.

Intubation through the nose.—A Magill soft rubber tube, of a size suitable for permitting easy to-and-fro respiration, is well greased with white vaseline and introduced into whichever nostril will allow easy passage into the nasopharynx without trauma to the mucous membranes. With the patient's head squarely in the anteroposterior position, the tube is advanced into the nasopharynx and thence into the oropharynx. At this point the tube is pushed on further, and in about 65 per cent of cases it will pass through the glottis and into the trachea, the natural curve of the tube facilitating this manœuvre. The tube usually will enter the trachea more easily when the patient is under light anæsthesia, if it is advanced toward the trachea when the patient inhales rather than exhales.

When the tube has passed into the trachea, a hallow blowing sound will be heard on expiration; if the tube has been advanced too far, breathing may become unilateral because the tube is in one or the other main bronchus. It is always well to expose the chest after the insertion of the intratracheal tube and note the character of the respirations, and if the breathing seems definitely to be unilateral, the tube may be withdrawn a few centimeters and fixed to the nostril in that position. For this purpose special adapters are needed to connect the intratracheal tube to the delivery tubes of the gas machine. Ether may be administered by the open drop method

with the tube in this position by placing a face mask over the free end of the tube if it is so desired.

In the event the tube will not pass easily into the trachea, but continues to enter the esophagus in spite of various rotations of the tube and changes in the position of the patient's head, a laryngoscope should be used. The laryngoscope is held in the left hand and the blade is carefully inserted in the patient's mouth while the fingers of the right hand spread the jaws open. The blade of the laryngoscope is used to depress the base of the tongue and is advanced toward the posterior wall of the pharynx until the epiglottis and the glottis are visualized. The head is now extended by means of the right hand until the trachea is clearly seen. The intratracheal tube, which could not be passed into the trachea blindly through the nostril, will now be visualized and it is withdrawn sufficiently so that the tip of the tube can be grasped with the Magill forceps and so directed into the trachea. Extreme care should be exercised to avoid any prying action on the teeth with the blade of the laryngoscope; adhesive plaster placed over the incisors will facilitate greatly the danger of chipping the dental enamel.

Intubation through the mouth.—If it is necessary that the tube be introduced through the mouth, either from choice or because of the nature of the operation, the same technic is used in introducing the laryngoscope as was just described for intratracheal intubation through the nose. In the majority of cases, however, the intratracheal tube can be inserted into the trachea without the aid of the Magill forceps. Intubation through the mouth also permits the use of intratracheal tubes of larger size which will more nearly fit the diameter of the trachea.

Waters uses intratracheal catheters with an inflatable cuff near the tracheal end of the tube, the cuff being inflated by means of another small tube connected to the catheter when it is in position in the trachea. This obviates the necessity for intratracheal tubes of numerous sizes and prevents leakage, which is advantageous when using the carbon dioxide absorption technic with relatively expensive gases.

If an intratracheal tube without an inflatable cuff is used, it is advisable to pack off the pharynx around the tube with a moist gauze sponge to prevent leakage of gases as much as possible. In operations on the nose and sinuses this will help to absorb blood and mucus from the nasopharynx and will minimize the danger of their aspiration into the lungs. If respiration becomes laboured, it is likely that mucus or blood has accumulated in the tube, and this greatly increases the patient's effort to inhale the anæsthetic mixture. An attempt should be made to remove this obstructing material, and it is often possible to clear the tube of mucus either by means of direct suction on the free end of the tube or by passing a small rubber

catheter, well greased with white vaseline, into the intratracheal tube and applying suction through it. If these manouvres fail, the obstructed tube should be removed and replaced by a fresh one. The new tube will usually re-enter the glottis easily without the aid of the laryngoscope if it has been introduced through the nostril.

INTRATRACHEAL INTUBATION FOR CHILDREN.

When intratracheal anæsthesia is to be used for children, as in operations for harelip or cleft palate, it is important that as much mucus be aspirated from the region of the posterior pharynx as is possible before introduction of the tube. Furthermore, one should use as large a tube as will be tolerated easily and still produce a minimal amount of trauma to the vocal cords. Occasionally, if only a small amount of mucus is in the tube, it can be displaced by increasing the pressure in the breathing bag, thus causing the patient to exhale against a slightly positive pressure, or it can be removed by using a smaller tube inside of the intratracheal tube as previously described. A minimum of anæsthetic mixture will be needed to maintain the required depth of anæsthesia provided the carbon dioxide absorption technic is used.

INTRATRACHEAL ANÆSTHESIA.

Group.	1935	1934	1933	1932	1931	1930
1. Surgery on digestive system ...	30	18	73	42	140	51
2. Neurologic surgery ...	326	231	161	108	51	39
3. Gynecologic surgery ...	10	2	6	5	...	2
4. Surgery on head and neck ...	519	560	405	446	358	178
5. Surgery on breast, thorax, and hernia.	8	12	30	31	28	30
6. Surgery on the colon ...	3	4	2	2	2	...
7. Orthopedic surgery ...	27	33	23	13	...	...
8. Miscellaneous surgery ...	6	1	8	5	...	...
9. No surgery ...	3	...	...	3	...	...
Total ...	932	861	708	655	579	300

COMMENT.

The various types of surgical procedures in which intratracheal anæsthesia was used at the Clinic from 1930 to 1935 inclusive, are given in the table. It will be noted that there has been a definite and steady increase in the frequency with which intratracheal anæsthesia has been used in the last five years.

It will be seen in table 1 that intratracheal anæsthesia was used 4,035 times in this period of six years. The explanation for the variation in group 1 is that in 1931 it was used largely by choice, whereas in 1934 and 1935 its use was limited to those cases in which it was definitely indicated. In group 2, the marked increase in the use of the methods was based on its advantage in securing quiet effortless breathing. In groups 3, 6, and 8 the infrequent use of intratracheal anæsthesia is attributable to the fact that it was

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required in only a very few cases, and then, only as an adjunct to ordinary inhalation anæsthesia. In group 4 the need for intratracheal anæsthesia is obvious because the surgical field must be clear. Even, smooth, light anæsthesia is preferred, and relatively fireproof conditions are essential. Operations in group 5 for thoracic tumour or diaphragmatic hernia usually depend for their success on the use of an intratracheal tube for the administration of the anæsthetic. In group 7 are included a few of the cases in which patients were operated on in the prone position, it being decided beforehand that anæsthetization and operation would thus be facilitated.

—Proceedings of Staff Meetings of Mayo Clinic, February 5, 1936.

Extracts

BASAL PULMONARY TUBERCULOSIS.

(B. GORDON & M. J. SOKOLOFF: *Trans. Am. Coll. Phys.* 1934. ii. 262).

Tuberculous lesions in the base of the lung without upper lobe involvement have heretofore been considered extremely rare, but recent studies reveal that the lesion is probably not as infrequent as formerly believed. In a series of 900 cases of pulmonary tuberculosis 11 basal lesions were found.

The lesions are more common on the right side, usually unilateral, and tend to remain localised. They are apparently relatively benign in character and associated with little toxæmia. Excavation may occur early. On x-ray examination two types of lesions are found. There may be an infiltration which resembles pneumonitis and must be differentiated from unresolved pneumonia, bronchiectasis and syphilis. The more common lesion is cavitation. Cavities are usually single, and because of their location, are often diagnosed as abscess.

Diagnosis is often difficult, as even in the presence of large lesions, tubercle bacilli may be absent from the sputum. For this reason the lesion may be diagnosed as abscess and referred for bronchoscopy. Bacilli may be found in the material obtained through bronchoscopic drainage. Because of unilateral character, surgical treatment is particularly applicable in these lesions. Artificial pneumothorax, sometimes with phrenesectomy, is followed by spectacular improvement.

Because of the benign character of the lesion and the favourable response to treatment, prognosis in basal tuberculosis is good. In a series of 11 cases, 10 were greatly improved and one died.

TREATMENT OF PEPTIC ULCER BASED ON PHYSIOLOGICAL PRINCIPLES.

(A. OCHSNER, M. GAGE & K. HOSOI: *Surg. Gyn. & Obst.* 1936. lxii. 257).

The treatment of peptic ulcer has in too many instances been focussed on the ulcer itself without realisation that the ulcer is merely a symptom. The causes for peptic ulcer can be divided into

two groups: one in which the factors are not amenable to therapy but are inherent and predisposing, and the other in which they are precipitating but can be corrected. The inherent or predisposing factors are tissue susceptibility and constitutional predisposition. The precipitating factors are hypersecretion, hyperacidity, focal infection and gastric trauma. Tissue susceptibility, which is an inherent quality present in all individuals, is the vulnerability of certain portions of the gastrointestinal tract to peptic digestion, such as the lesser curvature, pylorus, duodenal cap, jejunum, and other portions of the intestinal tract subjected to the acid gastric chyme, as Meckel's diverticulum containing islands of gastric mucosa. Constitutional predisposition, although difficult to define, is unquestionably present in most if not all patients with chronic gastro-duodenal ulceration.

As the predisposing factors are not amenable to therapy, the treatment of peptic ulcer consists in the prevention and the correction of the precipitating factors. The peptic ulcer patient must abstain from activities that increase gastric secretion and acidity. In addition to this abstinence, neutralisation of gastric acidity is favoured by a diet consisting of frequent small feedings, as food is an important neutralising agent. Administration of mucin is of value in controlling hyperacidity in many cases. Restoration of the normal function of the pyloric sphincter is of importance because it relieves gastric retention and also diminishes secretion which is stimulated by gastric retention. The relaxation of the pyloric sphincter permits free regurgitation of the alkaline duodenal secretion into the stomach and favours neutralisation. All foci of infection must be removed because they can act either directly by producing a specific inflammation of the stomach or duodenum, or reflexly, when within the abdomen, by producing pylorospasm. To minimise gastric trauma only bland fluids containing no roughage should be allowed. Because of the constitutional predisposition to ulceration, it is imperative that the patient change his mode of living.

The surgical treatment of peptic ulcer consists largely in the treatment of complications, such as mechanical obstruction, perforation, repeated hæmorrhages and danger of malignant change. In a case of pyloric occlusion with prolonged gastric retention and hypo-acidity, gastroenterostomy is the procedure of choice. In cases with hyperacidity or normal acidity, because of the increased susceptibility of the jejunal mucosa to the acid gastric chyme, the resection of the pyloric sphincter or the performance of a gastro-duodenostomy is to be preferred to gastrojejunostomy. The duodenal mucosa is more resistant to the acid gastric chyme than is the jejunal mucosa. The chronic calloused ulcer in the stomach, which does not respond readily to therapy should be operated on and radical resection done, because of the danger of malignant change.

ENDOMETRIOMA.

(N. ATTYGALLE & C.J.L. MISSO: *J. of Cey. br. B.M.A.* 1935. xxxii. 152.)

Endometriomata were in older descriptions classed as adeno-myomata, meaning thereby tumours consisting of glandular and muscular tissue. The term endometrioma was introduced by Blair Bell and the term implies that only the glandular tissue and stroma are neoplastic, and the muscular elements are due to a reactive hypertrophy of the myometrium. The essential constituent of these tumours is misplaced or ectopic mucosa of uterine or tubal structure. The tumours occur within and without the uterus, commonly in the pelvis, and their mode of origin has given rise to a great deal of speculation and controversy. The essential feature of these benign tumours is the presence in the depths of the uterine muscle, ovary or other structures in which they are located of islets of endometrial tissue, that is, glands with stroma or endometrial glands without stroma. The displaced tissues are liable to the same functional and cyclical changes as the normal endometrium, they menstruate like normal endometrium and if the patient becomes pregnant their stroma cells undergo the usual decidual reaction. When they menstruate, if the lumina of the glands open outside the blood escapes, but if the lumina are closed the blood accumulates and form cystic enlargements.

Endometriomata are well defined histologically. The ectopic tissue consists of endometrial glands lined by tall columnar epithelium which are occasionally ciliated, surrounded by a rich mantle of close set round and stroma cells reproducing the structure of normal endometrium and functioning like normal endometrial tissue, *i.e.*, menstruating.

Theories of origin. (1) Embryological: Wolfian rests, propounded by Von Recklinghausen, is discredited; Mullerian relics, were suggested by Russell.

(2) Derivation from lymphatic epithelium was suggested by Sitzenfrey, but no evidence in support.

(3) Cullen's diverticular theory is the oldest theory and explains endometrioma of the body of the uterus. He states that the glands and stroma dip down into the muscle and some glands open into the lumen of the uterus; others get cut off and are embedded in the muscle. This does not explain all endometrioma.

(4) The theory of serosal metaplasia of Ivanoff.

(5) Sampson's theory of reflux of menstrual fluid through the Fallopian tubes, the bits of endometrium later getting implanted in the pelvic tissue and ovary. This does not explain endometrioma in the uterus and bladder.

None of the theories explain the presence of endometrioma in all situations.

Sites of occurrence: Uterus (either diffuse or localised), uterine

ligaments, Fallopian tubes, ovaries, peritoneum, recto-vaginal septum, umbilicus, alimentary tract (colon, caecum, small intestine, appendix), bladder, laparotomy scars. The tumours occur during the period of active sexual life—chiefly between the ages of 30 and 50.

Main symptoms: Dysmenorrhoea occurring in a relatively old woman whose periods were painless before, should lead one to suspect endometrioma. Sterility is commoner with endometrioma than fibroids. Menorrhagia occurs in about 60 per cent of cases. Ovarian pain, stabbing in character or vague abdominal pain is present. Dyspareunia, painful defaecation and obstinate constipation commonly occur in recto-vaginal septal growths. These tumours are frequently associated with fibromyomata, inflammatory lesions of tubes and ovaries, and tuberculosis.

Treatment: Radium and x-rays may be used in women nearing 40 years. Most gynaecologists now do conservative operations depending on the site and extent of the tumours. In ovarian growths, the growth alone should be removed if possible, failing this, total removal of the ovaries is done. Uterine growths require hysterectomy, leaving behind the ovaries. If the growth is adherent to the intestine, this is shaved off leaving a portion behind; resection should not be performed as the condition is non-malignant.

Medical News and Notes

MEDICAL MEN AND BIRTH CONTROL. It is pleasing to find that medical men are acquainting themselves with contraception and birth control. It will be remembered that at the All-India Obstetric and Gynaecological Congress held last January at Madras there was a lecture on "contraception" by Mrs. Margaret Sanger. It will also be remembered that at the All-India Medical Conference held last December at Nagpur Mrs. Edith How-Martyn spoke on the same subject. These discourses at medical gatherings show that medical men are willing to be enlightened on modern methods of relieving certain kinds of human suffering. Without dogmatising one way or the other, the medical man should consider these questions from a scientific point of view and from no other.

TINNEVELLY DISTRICT MEDICAL ASSOCIATION. This association held its monthly meeting at Neyyoor on the 21st March 1936 by the kind invitation of Dr. I. M. Orr, M.D., F.R.C.S. (Edin.) of the Neyyoor Mission Hospital. In the morning members witnessed operations on bonegrafting for the spine, transplantation of the ureter, gastrectomy for duodenal ulcer and cancer of the lower jaw. After lunch some of the members attended the lecture-demonstration on the diagnosis and treatment of leprosy by Dr. Abraham at the Leper Asylum, and the others attended the clinical demonstrations in the wards by Dr. Orr. After tea, Lt. Col. T. S. S. Sastry, District Medical

Officer of Tinnevely presided and Dr. Noble of the Salvation Army Hospital read a paper on "glaucoma" and Dr. Orr delivered a lecture on "aetiology, pathology, and surgery of peptic ulcer."

The same association held a joint meeting with the Tuticorin Medical Union at Tiruchendur on the 25th April. A health exhibition was also organised on the occasion and was opened by Mr. W. T. Bryant, I.C.S., Sub-Collector of Tuticorin. Dr. Govinda Aiyer delivered a lecture in Tamil on the causation and prevention of such diseases as tuberculosis, malaria, cholera, etc. After tea, Lt. Col. T. S. Sastry, I.M.S., referred to the need for increased facilities for the treatment of cancer and pleaded for utilising the King George Memorial Funds for this purpose. The association passed a resolution to this effect. Dr. K. S. Iyengar, L.M.S., Civil Surgeon of Tuticorin, presided over the joint meeting of the two medical associations, when clinical cases were shown and described. Dr. S. Subramania Aiyer, M.B., B.S., of Karaikudi showed an apparatus for blood-sugar determination, and also exhibited a number of x-ray skiagrams taken at his clinic. P. Ramalinga Nayanar read a paper on "Revolution in Surgery." Dr. Mrs. Amritaraj of Tuticorin read notes of a case of cancer of the breast. The function terminated with dinner.

TUTICORIN MEDICAL UNION. A meeting of this Union was held on the 10th May with Dr. K. S. Iyengar in the chair. Dr. B. G. Krishnan of the Nutrition Research Institute of Coonoor delivered a lecture on "diet and disease."

TRICHINOPOLY DISTRICT MEDICAL ASSOCIATION. A meeting of this Association was held on the 29th March at the E. R. High School, Trichy, with Rao Saheb Dr. T. C. Joseph, Municipal Health Officer, in the chair. Dr. N. S. Krishnamurthy was "at home" to the members. Dr. T. R. Subramanya Iyer, a new member, was welcomed. Dr. V. Subramaniam, Honorary Dental Surgeon of the Headquarters Hospital delivered a lecture on "oral hygiene." Dr. T. S. Balasubramanyam, M.B. B.S., spoke a few words on the necessity for a balanced diet with adequate food factors and vitamins.

The same association met again at the Coronation Gardens, Trichinopoly, on the 26th April. Rao Saheb Dr. T. C. Joseph was "at home" to the members. Dr. T. S. Balasubramanyam, M.B., B.S., presided. Dr. M. Balammal, M.B., B.S., delivered a lecture on "placenta praevia." Members took part in the discussion.

MADURA MEDICAL ASSOCIATION. A general body meeting of this association was held on the 4th April with Dr. E. W. Wilder, M.D., in the chair. The association resolved to join the Tamil Districts Medical Federation. Dr. A. N. Menon, M.B., B.S., commended the revival of the local branch of the Red Cross Society. Dr. Narayana Iyer presented cases of interstitial keratitis in acquired syphilis.

CHITTOOR DISTRICT MEDICAL ASSOCIATION. This association met on the 18th April at the Headquarters Hospital, Chittoor, with

Dr. D. Krishnayya, District Medical Officer, in the chair. Dr. S. Balasubramaniam, M. B., B. S., read a paper on "tuberculosis and meningitis". There was a dinner at night.

COIMBATORE MEDICAL ASSOCIATION. A meeting of the above association was held on the 18th April at the M. G. Eye Hospital, with Lt. Col. N. K. Bal, I. M. S., District Medical Officer of Salem, in the chair. Dr. K. P. G. Menon, M. B., B. S., F. R. C. S. (Edin.) D.G.O. was "at home" to the members. Major A. I. Cox, I. M. S., District Medical Officer of Coimbatore, read a paper on "neurosis", which was followed by a lively discussion.

BELLARY DISTRICT MEDICAL ASSOCIATION. A meeting of this association was held on the 19th April with Lt. Col. A. S. Leslie, M.D., I.M.S., District Medical Officer, in the chair. Dr. C. A. Venugopal, L. M. S., Superintendent, Wellesley Sanatorium Jail, delivered a lecture on "diagnosis of early tuberculosis".

PUDUKOTTAH MEDICAL ASSOCIATION. This association met on the 24th April at the General Hospital premises when Dr. R. Narayana Rao delivered a lecture on "pneumonia". Dr. U. Sadasiva Aiyer, Resident Medical Officer of the Hospital, presided.

MALABAR DISTRICT MEDICAL ASSOCIATION. An ordinary meeting of the above association was held on the 3rd May at the Head-quarters Hospital with Dr. N. Achuthan, Vice-President of the association, in the chair. Dr. Manjeri Sundaram delivered a lecture on "my errors". Dr. Kamath read a paper on "diet". Dr. N. Anandan Pillai, District Health Officer, was "at home."

CONTROL OF DRUGS IN INDIA. Mr. B. D. Amin, B.A., M.S.C.I., Managing Agent and Director of the Alembic Chemical Works, Bombay has issued an appeal to the members of the Central Legislature urging them to move resolutions recommending to the Government the advisability of enacting a bill for the control of drugs as recommended by the Drug Enquiry Committee. He emphasises the need for efficient control of drugs for protecting the indigenous industry as well as to ensure the public health in view of the sale of adulterated and spurious drugs in the country. He welcomes the proper organisation of the profession of pharmacy and the registration of all the pharmacists. We heartily commend this appeal and earnestly hope that speedy action will be taken thereon.

MEDICAL QUESTIONS IN THE LEGISLATIVE ASSEMBLY. During the discussion on the Finance Bill in the Indian Legislative Assembly, Dr. T. S. S. Rajan, L.R.C.P. (Lond.) M.R.C.S. (Eng.) M.L.A., of Trichinopoly focussed the attention of the legislators on some topics pertaining to medical and public health matters. He denounced the Government's quinine policy, which had become more commercialised profiteering than humane. He said that there was no need for making any further special investigations and researches regarding the nutritive value of Indian diet and frittering away

enormous sums of money over committees who recommendations were never carried out. Most of the relevant facts about a nutritious diet were very well known, but the problem was to make this diet available to those badly in need of it. He suggested the formation of a Nutrition Board on the lines that exist in Japan and U.S.A. Dr. Rajan made pointed reference to the racial character of the Indian Medical Service, and wanted the ratio of two Englishmen to one Indian altered to two Indians and one Englishman. He also criticised the Women's Medical Service, the predominance of missionary influences therein and the lack of Indian women doctors in the higher ranks.

KAMALA NEHRU MEMORIAL HOSPITAL. On the suggestion of Gandhiji, it has been decided that the memorial to be erected for Mrs. Kamala Nehru at Allahabad should be a first-rate hospital. Mrs. Nehru had done a good deal to develop the present Congress Hospital and, it is stated, her parting message when she left for Europe was that the Hospital should be maintained at any cost. The Swaraj Bhavan trustees have decided to transfer a piece of land to the Kamala Nehru Memorial Committee for the proposed hospital. In addition to it Pandit Jawaharlal will transfer a cottage and some land belonging to him. The Finance Committee of the Allahabad Municipality has decided to recommend a non-recurring grant of Rs. 10,000 for the hospital. An appeal for a fund of Rupees three lakhs is issued. A trust will be created for the purpose and among the trustees will be Pandit Madan Mohan Malaviya, Dr. Ansari, Dr. B. C. Roy and Dr. K. N. Katju. The Kamala Nehru Memorial Hospital will be mainly for women and children, but a general dispensary will also be attached to it. With its establishment the present Congress Hospital will be closed.

THE GLAXO LABORATORIES. The transfer, from cramped and adapted town premises to a spacious semi-rural site, of a manufacturing concern based on scientific control is a vast undertaking. The Glaxo Company is to be congratulated on the successful way in which they have done this. A site of 15 acres at Greenford—that classic spot where Perkin discovered the first aniline dye—has given opportunity for considered and ordered design, an opportunity which has not been lost. A long well-lighted very modern building with only one floor above ground level is arranged so that raw materials brought in at one bay, adapted for easy unloading of lorries, pass through the various processes in their way across the factory part of the building to a dispatch bay, without confusion or unnecessary handling. In some cases raw material is brought to the upper floor so that it may be ground, sieved, mixed with other products, or otherwise treated; so the final preparation then gravitates to the lower level where it is divided into appropriate measured or weighed units and put in suitable containers for sale use. All this necessary

preparation is done with the minimum of effort and with proper regard to cleanliness, but without the eyewash of redundant precautions designed to make an impression on visitors.

The substances prepared at Greenford include vitamins A, B₁, B₂, C and D, parathyroid extract, the oestrogenic hormones, ergot alkaloids, pituitary extract, and antiviruses and similar bodies; many of them are sent out in admixture with suitable food products or mineral constituents which may be deficient in the human body and form useful adjuncts to the organic preparations. Milk and malt products and cod-liver oil of guaranteed potency are also handled at Greenford. Most of the products mentioned can only be offered with confidence to medical men and their patients if their activity and composition can be guaranteed as suitable and reasonably constant in batches made or sold at different times. The greater part of the upper floor of the Greenford laboratories is therefore devoted to control and research.

The chemical laboratory consists of one large room where research and analytical control goes on side by side. This arrangement which, although not usual, is followed in some other large laboratories, such as those at County Hall, has the advantage of enabling the scientific staff to survey the whole of the work and ensures the pooling of knowledge, experience and initiative, besides easing the dislocation caused by sickness or holidays. Chemical control is supplemented by physical examination where this is of service, as, for example, in the spectrometric assay of vitamin A. Chemical or physical examination suffices for some purposes and in others enable batches of material to be packed ready for issue, but where the question of activity is important, as in the case of vitamins, actual issue is delayed until experiments on animals have shown that the preparation is up to the standard. For this purpose a large animal department is kept up, in which thousands of white rats of the well known Wistar strain are bred and stored, both for sale to research workers and for experiments in the laboratory itself. Besides the laboratories mentioned others are devoted to bacteriology and the preparation of vaccines.

The occupation of the new laboratories was carried out very carefully; an illustrated pamphlet was distributed among the workers before the move was effected, and everyone could see from it where he would be working and how to get there, besides finding his way to any part of the building which might concern him. When a visit was paid to Greenford, a few weeks after the move, everyone seemed as "native and to the manner born"; the obvious newness of the building and some plant erection which was going on were the only signs that the place had not been running smoothly for years.

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I have great pleasure in writing to you that I used your LAXANTHINE ASTIER IN A CASE OF RHEUMATIC ARTHRITIS with remarkable success. The patient is a lady of 30 years, Temperature 102 to 103.5 with swellings of the right knee first and later the left also. I was giving her soda salicylas mixture as well for her pain all over the body.

I was daily giving her one 5 c. c. ampule of Neo-Riodine intravenously. After four injections the patient is completely cured. Swelling disappeared altogether. The temperature came to 100.8 the second day, and touched normal on the fourth day; and she is alright now.

I think I can safely recommend your LAXANTHINE ASTIER & NEO-RIODINE for Rheumatism and other infections.

The Urine was also cloudy and full of sediments which disappeared after three or four day's use of Laxanthine Astier. It became clear and free from Phosphate and other sediments.

Yours Sincerely,
Dr. P. KRISHNASWAMI.

Treatment of a case of Elephantiasis.

By Prof. NOGUER MORE.

Chief of the Dermatologic Service.

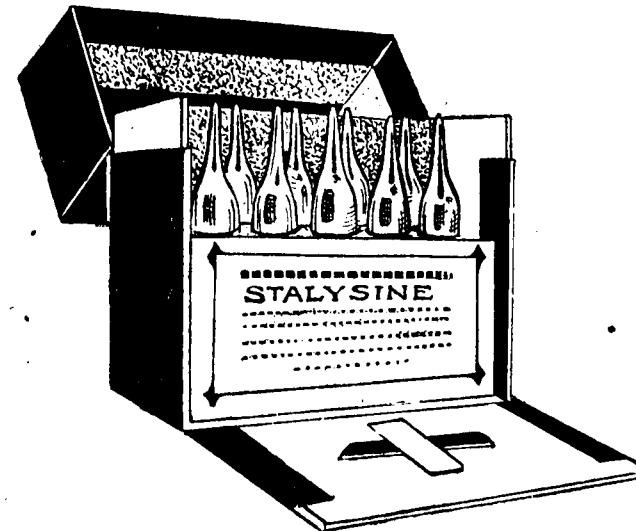
Hospital de la Santa Cruz.
BARCELONA (Spain.)

Professor Noguer More of Barcelona observed, some time ago, a case of chronic oedema, progressive and localised in the foot of a woman 38 years old, which oedema was neatly and anatomically turning into elephantiasis.

NEO-RIODINE intravenous injections, administered every two days, (10 to 15 c. c.) got quickly going the elephantiasis process.

The lymphatic vesicles started decreasing, and after them, the oedema and the hypersarcosis which evolutions allowed the patient to walk normally a few days after.

When ordering please mention *Medico-Surgical Suggestions.*



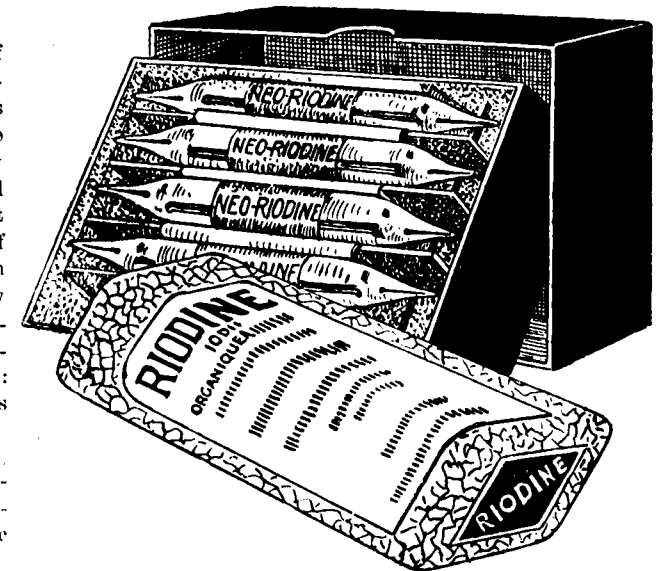
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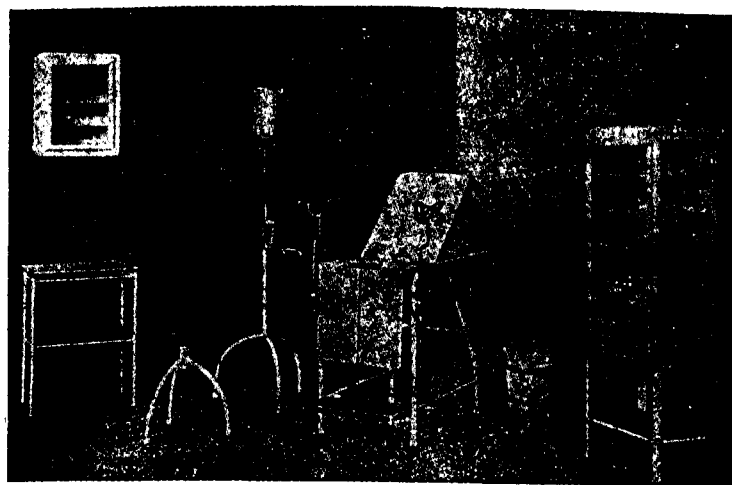
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