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The Antiseptic

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Edited by

DR. U. RAMA RAU & U. KRISHNA RAU, M.B., B.S.

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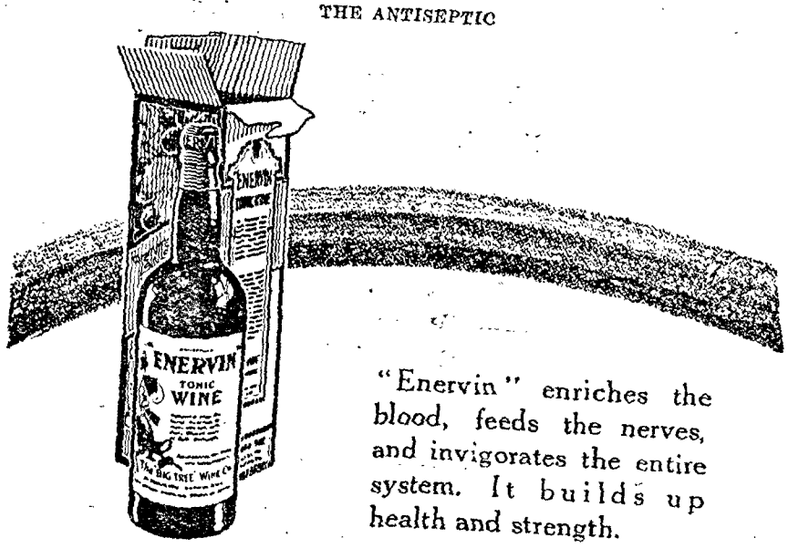

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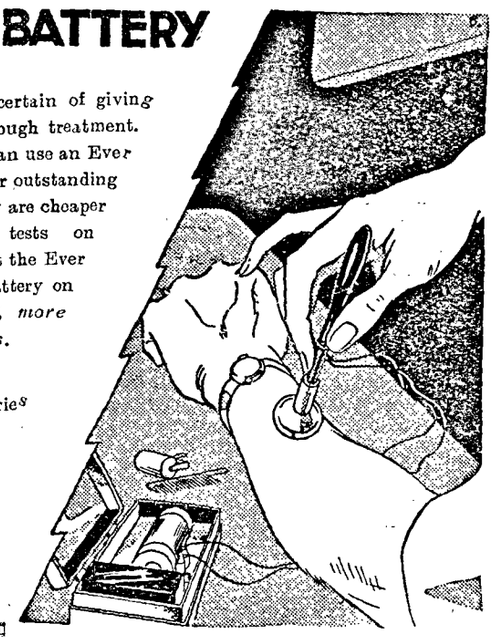

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Original Articles

ACUTE APPENDICITIS—ITS PATHOLOGY AND DIAGNOSIS*

BY

DR. S. N. MALHOTRA, M.B., B.S., F.C.P.S.,

Chief Medical Officer, Jubbal State.

THE appendix is very rich in lymphoid tissue in its wall. It has been compared to a Peyer's patch, thrust out from the bowel like the finger of a glove; and is sometimes called the abdominal tonsil. Numerous lymph follicles may be seen in serial sections of a normal appendix, lying in the mucosa or even the submucous layer. It is said that an appendix 3½ inches long contains from 150 to 200 or more such follicles. This lymphoid tissue reaches its height of development in late childhood or adolescence and from then on, its tendency is to undergo involutional changes resulting in sclerosis and atrophy. It seems likely that toxaemia or infection from some other focus in the body produces sudden swelling of this tissue, and is the cause of chain of symptoms characteristic of appendicitis.

Acute appendicitis may be catarrhal, suppurative, gangrenous or obstructive. It is the last one which is most commonly met with. The obstruction causes distension, partly from accumulated secretion and gas, and partly due to interference with the nourishment of the musculature of the appendicular wall, as the arterioles and venules are compressed; so that no nourishment is

* Specially contributed to the 'Antiseptic'.

received and the products of decomposition are not carried away by the blood to the liver, *via* the portal system. Thus the appendix rapidly becomes gangrenous and later gives way. If there are sufficient adhesions around the appendix, localised peritonitis will result with abscess formation; otherwise diffuse peritonitis will follow.

The rupture is more likely to come when purgatives have been given before surgical aid is sought; or when surgical intervention is delayed.

The cause of obstruction of the lumen of the appendix is:

(1) Faecal concretion or foreign body surrounded by faecal matter such as hair, coal, particles of enamel etc.
(2) Fibrous stricture resulting from ulcer.
(3) Kinking due to extra appendicular adhesions, causing obstruction of the lumen.
(4) Torsion of the mesoappendix, generally when it is long and the appendix unusually mobile.

Diagnosis.—In no other disease is the wrong diagnosis made more often than in acute appendicitis. Any one used to operating upon acutely inflamed appendix to any great extent probably have met with one of the following conditions:

(1) Perforated peptic ulcer, gastric or duodenal.
(2) Inflamed Meckel's diverticulum.
(3) Ruptured ectopic gestation.
(4) Torsion or inflammation of the uterine adnexia.
(5) Torsion of pelvic tumour, cyst, or fibroid.
(6) Inflamed gall bladder.
(7) Ileocaecal adenitis.
(8) Hypertrophied tuberculosis of the caecum or even new growth.
(9) Renal or ureteric calculi.

Respiratory conditions like diaphragmatic pleurisy mimic acute appendicitis very closely. Many surgeons blame the anaesthetist if the patient develops cough after operation. The lung condition may be present before operation, and it may be in fact the cause of the trouble diagnosed as appendicitis. Respiratory rate and pulse-respiration ratio are very important to eliminate respiratory conditions. It is a good rule to examine lungs in all cases diagnosed as acute appendicitis.

Other less serious conditions simulating appendicitis are: (i) Relapsing appendicular colic. Here the diagnosis is probable; but we must consider the possibility of ureteral calculus, which would be shown by a skiagram, and also of tubercular mesenteric glands, in which pain comes with or without rise of temperature. The pain may last a few hours or many days. Skiagram may show calcareous glands. (ii) Continuous right iliac fossa pain. This is seen in young women, and is often relieved by lying down. This is due to visceroptosis with a large dropped atonic caecum and appendicectomy will be useless. X-ray will help the diagnosis.

Murphy's teaching is that no case should be diagnosed as acute appendicitis in which the following symptoms do not appear in the order given:

(1) Pain, usually epigastric or umbilical.
(2) Nausea or vomiting.
(3) Local iliac tenderness.
(4) Fever.
(5) Leucocytosis.

Whenever this order is not present, it is safer to question the diagnosis. If fever precedes the onset of pain, or if vomiting accompanies or precedes the first bout of pain, it is generally not appendicitis. It is a fact worthy of note that an acute attack of appendicitis often starts in the middle of the night, and awaken the patient out of sleep. Pulse rate is not to be relied upon, as it is usually normal. If the pulse goes high while the temperature is subnormal and the patient feels better though he does not appear to be such, it indicates perforation of gangrenous appendix. If vomiting returns after it has once ceased, it indicates peritonitis after perforation.

Atropine in appendicitis.—Findlay found the use of atropine to be of great value in differentiating the pain and tenderness due to acute appendicitis from that due to other conditions. In any suspected case of appendicitis, the patient (adult) is given $\frac{1}{100}$ gr. of atropine sulphate by mouth unless nauseated in which case the drug is administered subcutaneously. Half an hour later, he is given soap and water enema. After enema is expelled, the abdomen is carefully palpated, and if any area of tenderness distinct and localised, persists in the region of the appendix, a positive diagnosis should be made. If enema has been only partially expelled and the entire caecum feels full, or emits gurgling sound on palpation, the atropine and enema should be repeated to ensure thorough

emptying of the large intestine. If either pain or local tenderness persists after this procedure, one is justified in making a diagnosis of appendicitis.

References:—

(1) Diagnosis of Acute Abdomen by Z. Cope.

(2) Recent advances of Surgery by Oglivie.

(3) British Medical Journal 1932, 1925, 1927.

(4) The Journal of American Medical Association July, 1933.

SPIROCHAETAL INFECTIONS*

BY

MAJOR B. G. MALLYA, M. D., F.R.C.S.E., I.M.S.,

Superintendent, Chittagong Medical School.

HAVING seen cases of syphilis in all its stages and forms, having come across two cases of rat-bite fever and a case of relapsing fever it is appropriate that we should discuss the different spirochaetal infections. The commonest of these is the *spirochaeta pallida* which is the causative organism of syphilis. As a rule it is transmitted during sexual intercourse and in the congenital variety, the foetus is infected in utero. The incubation period is about four to five weeks. The first thing noticed is a papule which becomes hard and breaks down and the diagnosis is established by finding the spirochaeta pallida in the serum exudate of this primary sore. The neighbouring glands are indurated.

About four weeks later the secondary eruptions appear in the form of a rash which is polymorphic in character. One notices papules, pustules, and vesicles. The latter break down and exude a discharge which dries up and forms crusts and the result is the typical syphilitic rupia. Mucous patches and condylomata in the moist regions of the body are seen in this stage. Fever, anaemia, pains in the bones and joints and iritis are the other symptoms of this secondary stage.

The tertiary stage sets in about a year to four years after infection ; the principal feature of this stage is the syphilitic node. These nodes may be found in the tongue, nose and larynx, in the bones, in the internal organs such as the liver, heart and brain, and in the subcutaneous tissues. Infection of the wall of

* Edited from a clinical lecture delivered at the Chittagong Medical School and specially sent to the 'Antiseptic' for publication.

large blood vessels by the spirochaeta pallida leads to idiopathic aneurysm. After a lapse of five to ten years the brain and spinal cord get infected and we see cases of general paralysis of the insane, tabes dorsalis and transverse myelitis. Abortion, miscarriage and still birth are common amongst infected women.

If however the infant is alive, it suffers from congenital syphilis, the chief features of which are a coppery coloured rash on the palms, soles and buttocks, rhinitis and snuffles, fissures at the angles of the mouth known as rhagades and mucous patches in the mouth. Cranio-tabes, condylomata at the anus, enlargement of the liver and spleen and a marasmic appearance are the signs during the first three months. The notched and peg shaped teeth known as Hutchinson's teeth belong to second dentition. The dome shaped first molars known as Moon's teeth, the depressed bridge of the nose, the sabre blade tibiae and eye affections such as iritis and interstitial keratitis belong to this age period. Juvenile tabes and general paralysis are late manifestations of congenital syphilis.

We may now form an idea as to the havoc wrought by the spirochaeta pallida on the human body. The diagnosis is established during the secondary and later stages by testing the blood for Kahn and Wassermann tests. Treatment consists in giving a course of injections of neosalvarsan or one of its substitutes, bismuth, mercury and potassium iodide.

The *spironema pertenue* is closely allied to the spirochaeta pallida. Yaws or Framboesia is the disease caused by the spironema portenue. It occurs in the tropics and is non-venereal but runs the same course as syphilis. Infection occurs through direct inoculation and children are mostly infected. Situated as we are in Chittagong close to Burma and Southern Assam we should come across a few cases of yaws here. The incubation period varies from two to four weeks, the primary sore appears at the site of inoculation as a papule which later breaks down and exudes a serous discharge which dries up and a crust forms on removing which, a granular ulcer is seen. The spironema portenue can be demonstrated in the serous discharge from the primary sore. Six to twelve weeks later the secondary stage sets in and an eruption appears on the face, neck, buttocks, perineum, axillae, and extremities. The appearance of this secondary eruption is the same as that of the primary lesion. The name frambosia given to this disease is derived from the resemblance of these secondary eruptions to raspberries. Both the primary and

secondary stages are accompanied by a febrile reaction, head-ache and pain in the bones and muscles. There is slight enlargement of the lymphatic glands and the spironema can be demonstrated in the serum removed by puncturing the gland.

The tertiary stage is demonstrated by the appearance of gummata which break down and leave chronic spreading ulcers. Nodules may form beneath the skin of the foot and cause a good deal of pain. Long bones of the extremities may be the seat of periosteal nodes. Spironema pertenue does not invade mucous membranes, viscera and nervous tissues like the spirochaeta pallida. Treatment consists in giving injections of neosalvarsan or one of its substitutes, bismuth injections which are cheaper or stovarsol by the mouth.

The *spirochaeta ictero haemorrhagica* is the causative organism of the disease known as infective jaundice or Weil's disease. Infection occurs through contamination of food or water by the urine of rats and other rodents which are suffering from this spirochaetal infection. During the war soldiers living in trenches infested with rats were suffering from this disease. Handling of infected soil in the gardens or fields and drinking the bath water may cause infection. The incubation period varies from six to ten days. The fever sets in with a rigor, pains in the limbs and vomiting. Temperature rises to 103° and keeps high for four or five days when it drops by crisis or lysis. In a fair number of cases there is a relapse of fever of mild type thus showing a resemblance to relapsing fever. Jaundice appears on the fourth or fifth day but it may be seen on the second day. The tongue is furred, bowels costive, liver and spleen enlarged and tender. Petechial haemorrhages are common under the skin. Bleeding occurs from the nose, bowels, stomach or lungs. The urine is loaded with albumin, bile pigment and casts. The pulse, rapid in the early stages, becomes slow with the onset of jaundice. The diagnosis is established by inoculation of guinea pigs with 4 c.c. of blood. The urine of the patient may be used in the later stages for inoculation. We have to differentiate this disease from catarrhal jaundice. Treatment is on symptomatic lines. In severe cases intravenous saline glucose should be given. Convalescent serum in a dose of 30 c.c. has been tried. The patient should be kept in bed till a week after the temperature is normal.

Spirochaeta Hebdomadis is the causative organism of the Japanese seven days' fever. Field mice form the reservoir of infection and convey the infection to man through urine which

contaminates the food or soil in which the men work. Bites of infected mice may cause this fever. Only symptom is fever of seven days' duration. The spirochaeta is seldom found though present in the blood.

A spirochaete has been found in the short spirochaetal fever of the Dutch East Indies. But nothing very much is known about its transmission.

Spirillum minus is the causative organism of a relapsing type of fever known as rat bite fever. Rats, cats and other animals convey the infection to man through bites. Japanese workers were the first to isolate the spirochaete from rats and human cases.

The wound resulting from the bite heals up leaving a scar which after a lapse of two to six weeks becomes painful and breaks down. The lymphatic glands and vessels in the neighbourhood become inflamed and tender. Fever sets in with a rigor and the temperature reaches 103° or over and lasts from three to six days. There is an interval of six days during which there is no fever and the patient feels better. Then the relapse comes on and the fever returns. So we get a febrile period and an afebrile period and this goes on till the fever subsides. A specific rash has been described which appears as a macular or petechial eruption over the face, trunk and limbs. It is, however difficult to find this rash on a pigmented skin. Several attacks of fever make the patient debilitated and anaemic. The diagnosis is established by the history of a bite by a rodent and the relapsing type of fever. In cases which are typical this can be verified by animal inoculation with the blood or gland juice. It is practically impossible to find the spirochaetes in the peripheral blood. We had two cases of rat-bite fever here which were diagnosed by the history of rat-bite and the typical temperature charts. The disease is seldom fatal. I had an occasion to perform a post-mortem on a case of rat bite fever. This person was given a gargle by a doctor and the patient accidentally swallowed some of this and died. To exclude the possibility of death by poisoning a post-mortem had to be held and this gave us a rare opportunity of studying the post-mortem appearances in a case of rat-bite fever. The site of the bite was ulcerated and there was induration of the surrounding tissues. The dorsal aspect of the left fore-arm was the seat of the ulcer. The axillary glands were enlarged. The spleen was soft and enlarged and weighed nine ounces. The cardiac muscle was soft and flabby. There was nothing else of importance to note

excepting an emaciated condition of the body. The treatment consists in giving an injection or two of novarsenobillon or one of its substitutes. Cauterisation of the site of the bite should be done if the case is seen early. In other cases painting with tincture of iodine will suffice.

Five spirochaetes have been isolated as the cause of relapsing fever occurring in different parts of the world. For our purpose it is sufficient to discuss the Asiatic variety. *Treponema Carteri* is the causative organism of the Asiatic variety. To name the rest we might mention the *treponema recurrentis* of the European, *treponema berberum* of the North African, *treponema novyi* of the American and the *treponema duttoni* of the Central African variety. All the relapsing fevers are caused by being bitten by lice with the exception of the Central African variety which is caused by tick bites. The incubation period is about seven days on an average. The first thing noticed is a rigor and the temperature rises to 104°. There is pain in the limbs and back and sweating. The spleen is palpable and a tinge of jaundice may be noticed. The fever persists for seven days or less and the temperature drops suddenly and remains normal for a week and the patient feels quite well. The fever relapses and we see another week of it and this is followed by an afebrile period. The fever may be irregular and the duration diminished during the second relapse and may last for only two to three days during the third relapse. The diagnosis is established by finding the spirochaete in the peripheral blood. The temperature chart is typical. Treatment consists in giving an injection of neosalvarsan or one of its substitutes. A second injection is seldom necessary. During the prevalence of relapsing fever steps should be taken to destroy lice. Clothes should be boiled or soaked in phenyle lotion. The hair should be smeared with kerosene oil.

Treponema gallinarum is the spirochaete that causes relapsing fever amongst fowls and is conveyed by tick bites. The ticks live in mud houses full of cracks and crevices and to prevent being bitten one should live in a cemented house and as ticks are busy at night a musquito net should be used.

Spironema schaudinni is said to be the cause of tropical ulcer or phagoedena which we see here. These ulcers are common amongst tea garden collies. They are situated on the legs and feet and run a chronic course. They may extend to the muscles and periosteum and leave considerable scaring and contractions. We have to diagnose this condition clinically. Treatment consists in

thorough scraping, touching with pure carbolic under an anaesthetic and application of some antiseptic dressing. Infection occurs through walking bare footed in endemic areas. So boots and puttees should be worn.

Spirillum of Vincent is the causative organism of Vincent's Angina. In this disease the throat is affected and the breath is offensive. The lymphatic glands on the affected side become enlarged and there is a rise of temperature to 101. The disease is common amongst debilitated persons, and in camps and cooly lines. On inspection of the throat a membrane is seen which becomes detached leaving an ulcer which is situated on the tonsil. The disease runs a mild course on the whole and has to be differentiated from diphtheria which is easily done by finding the specific spirillum and bacillus of Vincent and the absence of the Kleb-Locffler's bacillus. Even untreated cases get well. Neosalvarsan or one of its substitutes may be injected as well as applied locally in solution. Frequent antiseptic gargles and application of hydrogen peroxide may be tried.

Treponema Bronchial is the causative organism of Bronchial Spirochaetosis. We do not see cases of this infection here. In some cases there is fever and cough. In others there is no fever but the expectoration is blood stained. Still others have a chronic cough but no expectoration. The symptoms resemble those of chronic bronchitis and the examination of the chest may reveal the presence of moist sounds. The sputum is examined for tubercle bacilli in vain but spirochaetes are found. Treatment consists in giving injections of neosalvarsan or one of its substitutes.

Spirochaeta Gallica is the spirillum said to be the causative organism of trench fever which was common amongst troops living in trenches during the war. The louse is the carrier of this disease. It is seldom seen amongst the Civil population.

There are some more spirochætes which are not of much significance from a clinical point of view.

ON THE POSSIBILITIES OF NON-SPECIFIC PROTEIN (MILK) THERAPY*

BY

MAJOR A. K. NANDI, A.I.R.O., I.M.S.,

Burdwan.

THE introduction of *non-specific protein* as a prophylactic and therapeutic agent is certainly a comparatively new idea in medicine. The idea, primarily, is to fillip up the defensive mechanism of the organism to an increased production of leucocytes and thus, of the combatant phagocytes. A number of such *non-specific proteins* have already been put on the market, such as Nuclein (Nucleinic Acid), Edwenil, Antibacsyn etc., while homely milk is the last to find a place in the catalogue of the acclaimed virtues. Each is useful, but each has its drawbacks. Nuclein causes a smart local reaction which tends to last a few days, while the cost of Edwenil and Antibacsyn is rather prohibitive for the purse of the average sufferer, although this injection is free from any unpleasant reaction. Milk, it must be admitted, does give rise to a reaction if injected beyond a certain limit, but the cost, which comes to very little, counts a good deal, and that is one reason why it has practically captured the field of *non-specific protein* therapy. It is not to be understood, however, that cheapness is the sole reason of its extensive use. No, the stuff is a *really useful* agent in its way.

Preparation of the Milk for Injection

Ready-made milk can, of course, be had in the market put up in ampoules for injection, such as Aolan, Lactolan etc. But each ampoule costs something which the majority of poor sufferers in poor India do not find it convenient to meet. Should, then, such cases go without the benefit of milk therapy? No, if they cannot afford the luxury of ready-made milk, milk can be made ready for them in the practitioner's surgery and certainly in any dispensary or hospital. Take the desired quantity of whole milk in any clean tall glass vessel and boil it for from 15 to 20 minutes. The fire must be low and the milk should only simmer. Next take the vessel off the fire and allow it to cool. After about 5 to 10 minutes (depending upon the temperature of the room and the quantity of the milk) brush aside the pellicle on the surface and

* Specially contributed to the "Antiseptic."

either decant or syphon off the milk into a clean glass 2 oz. measure glass. The milk is now ready for use. The desired quantity of milk is next drawn off from the junction of the lower and middle thirds of the milk column in the measure glass and injected into the gluteal muscles after surgical cleaning of the skin over the same. After the operation the injected area should be massaged for a few minutes and the patient warned against the possibility of some local and general reaction. In the absence of any smart reaction the injection can be repeated after 3 to 4 days.

Modus Operandi of the therapy—Milk-protein would seem to stir up the hæmopoietic system to emergent activity and mobilize the defensive forces of the organism.

Leucocytosis is an undoubted consequent, but there is likely to be something more at the back of the reaction. The reaction is, in many cases, profound, and unexpected events of a therapeutic character have certainly been noticed by myself.

Sphere of action of the milk-protein agent

Diffidently, I ventured to make my first acquaintance with the agent in a case of otorrhœa which appeared to resist all reasonable treatment. I began with 3 c.c. and finished up the 3rd injection with 7 c.c. The result following the 2nd injection was highly encouraging—the discharge was gone. I ventured to push in the treatment and was surprised after a few more to find the apertur of perforation in the membrana tympani lessening in size. Altogether I gave the case 7 injections, and the patient left off treatment very happy with a clean ear and restoration of hearing, which was in abeyance for nearly 18 months! Thus encouraged I have ventured further afield and have used milk-protein as a therapeutic agent in a variety of cases, a classified list of which is subjoined below :—

A. Diseases of the Eye:—

(1) *Nebula*—1. All but cured with 2 injections after which the patient left off treatment.

(2) *Leucoma*—7. Opacity distinctly less in 5 cases with definite improvement of the symptoms. The condition was of all grades of severity. 1 to 4 injections were used. For private reasons the patients coming from the rural area could not afford to stay and undergo the treatment longer.

(3) *Hypopyon*—1. Cured with 2 injections only.

(4) *Acute Conjunctivitis with Chemosis*—3. 2 Cured with 2 injections each. 1 left off after the 1st injection partially improved.

(5) *Marginal Blepharitis*—1. Cured after the 3rd injection.

B. Diseases of the Ear:—

(1) *External auditory meatus*—Boils in and inflammation of —2. Complete cure after the 3rd injection in each case.

(2) *Otorrhœa*—4. Each cured with 2 injections.

(3) *Membrana tympani*—Inflammation or perforation of—8. Treatment encouraging on the whole. The inflammation subsides, the aperture of perforation contracts and hearing has improved in all cases but 3.

C. Gonorrhœa—Acute and Chronic—3. Improvement in each case after the 3rd injection.

Arthritis, Peri-arthritis, Teno-Synovitis, gonorrhoeal and non-gonorrhœal.—5. Manifest improvement in each following the 3rd injection.

D. Minor Septic Diseases—Abscess, Cellulitis, Whitlow etc. — 7. Improvement in each case with 2 to 4 injections.

E. Lumbago—1. Cured with 2 injections.

F. Malaria—quinine resistant—2. Enough quinine was given to each calculated to complete a cure; but the patients did not simply "take" the drug. Each was then given 2 injections of milk, following which they showed a responsivity to quinine therapy.

G. Disease of the Skin.—

(1) *Scabies*—2. Improvement shown by each after the 2nd injection. The one that stuck to the treatment was completely cured after the 5th injection.

(2) *Eczema*—4. Decided improvement followed the 2nd or 3rd injection. None remained longer.

H. Sciatica—1. Improvement followed the very first injection, but the patient had to leave off treatment for private reasons.

I. Dyspepsia—1. This was a case that resisted apparently rational treatment. Responsivity to the very same treatment appeared after the 1st injection.

J. Chronic Frontal Sinusitis—1 of six months' duration. Had resisted prolonged treatment. Improvement followed the very first injection and is progressive.

A total, thus, of 54 cases of promiscuous variety have so far been treated by me, and the results obtained are encouraging enough to tempt me to pursue the line of activity. As the treatment seems to have decided influence upon sores and ulcers, it would be interesting to try to ascertain what action, if any, it has on gastric and intestinal ulcers both of the small and large intestine, such as duodenal, typhoid and dysenteric ulcers. Very true it is that the administration of lacto-protein somehow or other profoundly influences the reparative mechanism of the body and makes the system respond to rational therapy where this has been previously lacking, *e.g.*, the quinine-resistant cases of malaria already referred to. The hæmopoietic system certainly receives a vigorous shake up; but I am inclined to believe that there is something unseen in the background in addition. I am convinced lacto-protein therapy will hold its own and reveal newer possibilities with more extended use.

Milk-protein has its use in pre-operative surgery where it "prepares" the cases for operation, and given after operation it appears to hasten cure.

I have to thank Col. Singh, I.M.S., Civil Surgeon Burdwan, for very kindly permitting me access to the Burdwan Fraser Hospital register of milk therapy.

ECLAMPSIA*

BY

DR. (MRS.) ANNA THOMAS,

Lord Chelmsford All-India Maternity and Child-welfare Gold Medalist, Karachi.

ECLAMPSIA is the chief scourge of the lying-in women and their unborn children. One well known American Obstetrician affirms that in his city, yearly 5000 women die from eclampsia and 6000 from infection. Also about one and a half to twice as many children die from eclampsia. In Soviet Russia, England and U.S.A. it is estimated that annually 20,000 women die of eclampsia. Reports of England and Wales show that the loss of life is greater from eclampsia and albuminuria in connection with pregnancy and

* Specially contributed to the Antiseptic.

delivery in those countries (Janet Campbell). In all the western countries the opinion is fairly united in this matter, and the reports of various hospitals as well as the experience of individual obstetricians prove this fact clearly. 70 per cent of the deaths in first pregnancy are due to eclampsia (Lancet). Dr. Klien, M.D., reports that during 10 years in his Clinics, out of 7263 deliveries, 162 cases of eclampsia occurred, that is, 2.2 per cent. Maternal mortality was 3.7 per cent, and foetal mortality .32 per cent. Of these 162, 82 had convulsions and in this group, maternal mortality was 30 per cent. 95 were delivered spontaneously, 27 by forceps, and 16 by Caesarean section. Among spontaneous deliveries there was no maternal mortality, and foetal mortality was 26.4 per cent. Among caesarean section, maternal mortality was 6.2 per cent and foetal mortality 26 per cent. 22 of the 162 were suffering from pre-existing nephritis. Eclampsia awakened such interest, it is said, that 1,009 papers on this subject were published in Germany in 3 years. It is a pity that there is no reliable statistics available in India on this subject. I do not know if any practitioner in India has kept a record of cases in his or her practice and made any investigation regarding the best form of treatment for eclampsia. I am sorry, I have not been able to keep a systematic record about it myself. In my last 19 years of experience, both in Hospitals and in private practice, I have come across about 150 cases of eclampsia. When I realised the importance of the Ante-natal care of pregnant women, I directed my full attention to preventive measures when the cases were entrusted to my care early enough, and I am glad to say that in 95 per cent of the cases, eclampsia was successfully prevented. In looking into the record of the past two years of my Maternity Homes here in Karachi, I find that all the pregnant women who registered early enough, and who sent their urine for examination periodically as advised, and who consulted at the appearance of any danger signal of pregnancy, never developed eclampsia even when there was albumin in the urine of some of them. Certain cases who were admitted with premonitory symptoms of eclampsia also escaped with one or two fits either before or after delivery when careful prophylactic measures were adopted by proper diet and treatment. But such cases required constant personal attention and careful watching from the interferences of the ignorant relations of the patients. When the patient is kept on barley water alone, sometimes a foolish relation under the advice of a Dhai or old women neighbours, give stealthily rice and curry to the patient

and spoil the case. These things often happen when the patient is treated in her home. Even in the Maternity Home, they try to do these things if the Nurse in charge is not very vigilant. Recently, I had one case, a young Marwari woman of 18 years primipara, who was brought to the Maternity Home with oedema on the face, extremities and abdomen and in a state of very advanced condition of pregnancy. On examination, I concluded that if she was sent back home she might die on the way, and personally I was not at all confident that I shall be able to save her from fits and inevitable death. I explained the situation to the relations, and they implored me to keep her there under any circumstances. So, she remained under treatment for 3 days and after 3 days she had a normal delivery. Soon after delivery, I noticed that she was developing symptoms of fit and I gave her morphia injections and watched her, but within a short time with one fit, she collapsed two hours after delivery.

Professor Herbert Spencer of the London University, once pointed out that " eclampsia was one of the bugbears of the profession ". Overtreatment also is dangerous in the case of eclampsia. The method of rapid delivery also is equally dangerous. Scientific committees were appointed throughout England to collect and work out the material obtained and report on the conclusions drawn at a Congress of English Obstetricians specially called for the discussion of this problem. Dr. Eden asserted that " it is impossible to avoid the conclusion that the majority of the fatal cases were overtreated, and that in a considerable number the excessive treatment must have been a contributory factor in bringing about fatal results " (' British Medical Journal ' 15th July, 1922). The German experts assert from their investigation that 4 per cent of women treated by rapid delivery died owing to the operation undergone by them. The Obstetrician has to excercise great care and skill in determining the mild and severe cases of eclampsia. The London Committee above referred to stated that the condition of an eclamptic patient should be considered dangerous when the following symptoms were to be found : (1) Coma, (2) a pulse rate over 120, (3) a temperature above 103° F., (4) a number of fits greater than 10, (5) urine which becomes solid on boiling, (6) the absence of oedema, (7) a blood pressure above 200 mm. When a patient exhibits any two of the above symptoms, that case should be considered severe.

There is a tendency among some doctors especially of the public institutions to resort to the method of rapid delivery by

caesarean section when cases of eclampsia are admitted. Dr. Welz says that " in no condition is caesarean section so contraindicated as in eclampsia, or the toxemias of the late pregnancy" and he also states that " while the mortality of the parturient women is 6 to 1000, in caesarean section it is 130 to 1000. Chloroform (suffocating method) is said to be particularly dangerous to eclamptic patients ".

From a study of all available literature on the subject as well as from my personal experience, I fully agree with the opinion that in dealing with eclampsia, prophylactic method is becoming the main if not the only method of treatment. With regard to the origin of eclampsia there is no definite knowledge. There are many theories, and the most credible among them are what are known as the Ovular and the Neural theories. Statistics show that the larger '*ceteris paribus*,' the number of fatal cases, is, the larger, the number of fits. Some Doctors have reported about a kind of so-called eclampsia without fits. But sufficient data have not yet been available about this. Every fit produces a most destructive effect on the organism of the patient, and the more so, the weaker she is. The destructive power of the fits also depends on their strength and frequency, and on the other hand, on the resistance of the organism, and on the strength of its defensive powers. A case of a patient who had 37 post partum fits within 8 days after delivery is reported. There are also cases reported of patients recovered after 200 fits. On the other hand in exceptional cases, the first fit may kill the patient. The entire skill in treating eclampsia consists in succeeding to create such conditions as will interrupt the fits and at the same time lessen the vascular spasm.

In this article, consideration of space forbids me to enter into any more details. I shall conclude with a few words with regard to the prophylactics of eclampsia and eclampsism. Believing that eclampsism to be the result of toxins accumulating in the blood, owing to their excessive penetration or insufficient reduction, we are induced to recommend to such pregnant women as show a tendency to eclampsism (oedema, increased blood pressure) a diet favouring the activities of the secretive organs and those of the defensive apparatus, the liver and the reticulo-endothelial system in particular. Moderate diet without large quantities of food containing animal proteins and fat, a great deal of time spent out of doors, such exercise as is proper for a pregnant woman, keeping the skin warm and clean, the administration of baths, care as to the regular action of the bowels, the removal of any considerable

psychic irritation—such is the advice we can give to women who are liable to eclampsism. The examination of urine and blood pressure should be carried out at least once a month or even once a fortnight, if one or two of the above indicated symptoms of eclampsism are present.

In mild cases of eclampsism one may limit oneself to the application of the prophylactic measures suggested above. When more acute headache, increased blood pressure (140 mg., and more), and the presence of albumen are observed, either mixed or complete milk diet should be recommended, as dependant on the severity of the lesion. Besides, the patient should be advised to stay in bed, and have a bath of about 97¼ F. every day, taking care to keep warm after the latter.

If the head-ache is severe and the patient suffers from insomnia, small doses of morph. muriat., ⅛—⅙ grain (0.008—0.01 gm.) are given once, or rarely twice, in twenty four hours, and at no less than a twelve hours' interval. The last thing at night she gets either gr. v—x (0.3—0.6 gm.) of veronal or 16, 20, 24 gr. (1.0, 1.25, 1.5 gm.) of chloral hydrate by the mouth, if the patient retains it; if she rejects it, then per rectum. Mild purgatives, enemata,cascara,medium doses of salts, chiefly magnesium sulphate, are recommended. The removal of any irritations.

Usually a similar treatment causes these phenomena to lessen or even entirely disappear, but in some cases they increase again after a few days or a week, as the time of labour approaches. Then it is advisable to interrupt pregnancy, which is best accomplished by the rupture of membranes. In primipara we dilate the Cervix by means of Hegar's Dilators, using them up to numbers 10—14, and then rupture the membranes by means of dressing or bullet forceps. If cervix admits a finger there is no use of applying dilators. In multipara such a condition is not infrequently observed. The uterus is found to be in a state of increased irritability in eclampsism, and therefore labour usually takes place very soon. The foetus is often found to be small, due to eclampsism as well as to its not infrequently being premature.

Careful attendance to child within the first 24 hours subsequent to parturition is most important. It is beyond doubt that the narcotics affect it, and it shows great tendency to sleepiness, and not infrequently does not breathe well. Artificial respiration, stimulants, counter-irritation, warmth, and careful observation within the first 24 hours, as a rule, serve to obtain the desired result in fully developed children. It is premature

children who die most frequently. The advantage of prophylactic method with regard to the foetuses consists in the fact that antepartum eclampsia is often stopped by it, and pregnancy goes on to the full term with a living foetus.

SPECIALISED ABILITY AND GENERALISED DISABILITY IN MEDICAL SCIENCE *

BY

V. ISWARIAH, B.A., M.B., B.S., M.R.C.P.E.

Department of Pharmacology, Medical College, Vizagapatam.

PERIODICITY has been the rule not only in nature but in man made things such as fashion in Society, Art, Science and Literature. The tight pants of yesterday are spurned by the loose Oxford Bags of to-day. The hooped prodigious petticoat of the Mid-Victorian days was followed by the critically short one till to-day when the long again seems to be gaining ground. Views and ideas of man have never been consistent, cogent or clear. Instead, they have often been conceited, chæmeleonic and constipated, if unchanging. The virtue of to-day becomes the vice of to-morrow. Judging from English History there is a natural ebb and flow in standards of virtue. Fiction in Literature tends to show that the Stewart period of heroine was for the most part a quiet stay at home being with the gentler virtues of loyalty, steadfastness and piety. The Hanoverian playwrights and novelists on the other hand admire a more active type - a dashing woman with her wits about her approaching the suffragette type. The views regarding science have in no way been an exception to to this rule. A high standard was expected of a Scientist in his field before being considered one worthy of the name. This was succeeded by a precipitous desire for intense specialisation in a very restricted area of any particular Science. To-day the pendulum seems to be swinging in favour of a general extensive high average ability.

The relative merit of high average and specialisation is not being considered here but the place and scope of each in the world of Medical Science and education. Very often the supernormal beings are subnormal when judged by a number of standards for the average;

* Specially contributed to the 'Antiseptic'.

indeed for one to be supernormal he has to be subnormal in some, if not abnormal. Psychological tests of intelligence are applied to recruits for the American Navy. This is just testing the average intelligence for if this test is widely adopted they would probably lead to many persons of great artistic capacity being classified as morons. First rate mathematicians, eminent scientists, astute philosophers and sparkling literary men may have been eliminated by this test, for often specialised ability goes with generalised disability. The Researcher who makes intensive special study of unexplored field has an indespensable place in the economy of science, but is a wrong man as a teacher or to fill a place in a predominently teaching institute. It is the man of high average who is valuable. To the teacher or the man who is to impart truth to plastic minds, the research spirit is very often a disqualification. A fundamental qualification of a researcher is a spirit of enthusiasm and enthusiasm is often an enemy of truth. Earl Balfour once said truly, that enthusiasm was a great thing but it was a pity that so few enthusiasts could be trusted to speak the truth.

In the premier faculties and Universities of the west, the teacher of students taking up a degree course is expected to have held in addition to the degree that he is coaching students for, a post graduate degree or diploma. The basic degree or qualifying diploma is inevitable but a higher degree of general ability is certainly desired, nay essential. Scientists of eminence who have to their credit epoch making discoveries, may in rare instances not have been the holders of any degree or diploma or academic in any ordinary sense. But a clinical institute with important teaching functions to perform insists on higher than the basic or graduating qualification on its teachers. In Physiology one has to think of a Starling, Lovett Evans or a Sampson Wright; in Bio-chemistry of a Barger, Dodd, Cole; in Pharmacology a Cushny, Clarke Varny or Dixon, in Pathology of a Muir, Boyd, Mac'Allum. The question arises—"Is specialised ability inconsistent with generalised ability"? Arguing the other way round one who is generally able cannot but be able for specialising, for, logically, part is included in the entire. Though specialised ability is not at variance with generalised ability, in practice the very demands made on a narrow specialist tends to a large extent to shut out the interest and efficiency in a generalised field. A specialist is like a tube well penetrating into the depths in a restricted space without any knowledge of the extensive surface above.

In some places the inordinate craze for specialisation has the fillip from authorities with angularities who select specialists for teaching jobs-specialists who had made intensive study of very tiny spots in their spheres already much too cramped. Sometimes, one who has specialised in the pendulum movement of the middle third of the jejunum of a cat becomes a teacher of Physiology. One who had observed the effect of Quinine on the seasonal variation in the oxygen consumption of the bladder of a rat found in Pennysylvania, becomes an authority in Pharmacology. Another who had studied the effect of shifting the methy radical from the para to the meta position in an organic compound found in the Pineal body of a mouse becomes a Bio-chemistry Professor. And yet another may be declared eligible to be the director of a Pathological Institute whose primary work is to teach, on the strength of his study on the alteration of the pH of the culture media for the growth of a coliform Bacilli found in the alimentary tract of some varieties of Gymnopathecus of Africa. A specialist has his field for further specialising or investigation but a predominently teaching work needs a high standard of general knowledge and a possessor of a research degree is precisely the square man.

The London diploma conferring examinations have realised this and insist correctly on a high all round efficiency. A candidate for the Fellowship in Surgery is expected to have attained a high standard in even subjects like Physiology and Bio-chemistry. The corresponding examination on the medical side again amply justifies its lack of specialisation by insisting on the attainment of a high general standard by one who is admitted as a member. They are the men of choice for a teaching institute and not the narrow specialist.

The future of medicine according to Pygmalion (the doctor of the future) rests with the Physician of general outlook as opposed to specialists. Specialists are necessary but their work is properly to amplify in a given direction the observation of the Physician and not to attempt to take control of operation on their own behalf. The day when the treatment of diseases can safely be entrusted exclusively to Bacteriologist, Radiologist, Physiologist or even to Surgeons is rapidly passing away. The Physician of the future will not as is now usually assumed be a thorough Scientist of the orthodox type-a man with the technique of the laboratories at his finger ends and with the aim in his mind of elucidating the phenomenon of life in terms of Chemistry and Physics. Rather

he will be a humorist - a man with the widest possible and a high level of average knowledge of human nature. Even if his 'spirit' of research is above reproach, the 'method' is open to question.

Lord Moynihan in his address at the opening of the Banting Research Institute in Toronto a couple of years back, complained that Physiologists were neglecting research on man and were concerned too much with animal research. Their aloofness from medicine perforce makes their discoveries of less use to the clinician. The question is often asked "Is there then a science of experimental medicines of which the actual material for study is the human patient?" Or is the Physician or Surgeon to rest content with the application in his art of scientific results worked out in the laboratory? The assumption is certainly amusing that ready made weapons are fashioned in the laboratory and handed over with magisterial authority to the Physician who humbly acquiesces in their prescribed use. A specimen answer to this question could be had from the fact that advances in knowledge of gastric and duodenal ulcers and cholelithiasis had been made by Surgeons with little help from the laboratory. Indeed the contribution of the laboratory to the surgery of the stomach was not only almost negligible but was potentially dangerous because so divergent from human experiences. Physiologists and Pharmacologists were too concerned with mice and cats and too little concerned with man and humanity. Lord Moynihan concluded his address by earnestly pleading for the foundation of chairs of human physiology as a means of bringing together workers in the wards and in the laboratory. Barring the stray instance of a Haldane on the study of man as a whole and of A. V. Hill on man's capacity for muscular work very little of human Physiology has engaged the study of the so-called Physiologists.

The clinic goes a step further to say that there is at present really too much of the stuff called "Research" of all kinds-clinical and laboratory, much of which is quite useless and only cumbers the ground. It is high time that as Lord Moynihan pointed out some line is drawn between research of utility and research of scientific value and people are able to assess degrees and values with a clearer view of things.

UTERINE HÆMORRHAGE*

BY

DR. J. N. KARANDE, M.D.,

Bombay.

UTERINE Hæmorrhage has received special attention from clinicians of great fame like Dr. Wilfred Shaw. Recent investigation on endocrinology especially the anterior pituitary gland and the ovaries has thrown a good deal of light on the causation and treatment of uterine hæmorrhage without any pathological cause. We may hope to treat these cases of intractable bleeding from the uterus with endocrine treatment and save a good many uteri from the surgeon's knife and many woman from premature menopause resulting from exposure to X-Ray and Radium. So far, the pendulum was swinging to Surgical remedy for gynaecological troubles, now medicine will take its place.

Uterine Hæmorrhage may result as a result of general systemic disturbance or may be due to some local cause or it may be due to disfunction of the endocrines especially the anterior pituitary and the ovaries.

Every case of uterine bleeding must be thoroughly examined. The history of the case must be carefully taken. Age of the case must be noted, as there are certain causes of uterine bleeding peculiar to particular stage of life of a woman. It is also necessary to enquire into the relation of bleeding with menstrual period.

Uterine bleeding may be menstrual discharge which may be prolonged or profuse—menorrhage. It may be too frequent *i.e.*, inter menstrual period may be short epimenorrhage or the bleeding may be quite independent of the menstrual period—Metrorrhagia. These old terms are still useful for classifying uterine bleeding and also in determining its significance.

Causes of Uterine Bleeding

General, Endocrine and Local. The local conditions include those due to pregnancy.

General Causes

High blood pressure, Arterio Sclerosis, chronic renal disease, purpura-scurvy. Hæmophilia is not so uncommon in women as it is generally supposed. Heart diseases especially mitral stenosis are in rare cases responsible for uterine bleeding; changes of climate and shock, sometimes cause uterine bleeding.

* Specially contributed to the "Antiseptic".

Endocrine disturbances. Recent investigation by men like Schrolder, Shaw, Novak, Groves have thrown a great light on the causation and treatment of uterine bleeding. The ovaries secrete two internal secretions with quite opposite actions. Oestrin which is also found with the urine of pregnant woman, placenta, amniotic fluid, eggs etc., stimulates the endometrium and leads to its congestion. The other, progestin, is the luteanizing hormone which sensitizes the endometrium and makes it fit for reception of the fertilized ovum.

The ovarian hormones are under the control of anterior pituitary hormones which are two, prolan *A* and prolan *B*. Prolan *A* is present in the urine of pregnant woman. Prolan *B* is also present in the urine of pregnant woman. Disturbances in the production of the pituitary hormone lead to disfunction of the ovary which in turn leads to disturbance of menstruation.

Local Causes

Those associated with pregnancy are possible in girls before puberty. There is a possibility of making a mistake in diagnosis in cases of bleeding caused by ovarine disfunction, as it is very often preceded by a period of amenorrhoea of 2 or 3 months. In such cases curetting and microscopic examination is the only way to decide the diagnosis or Accherin Zondak may be used.

Disturbance of pregnancy is the first cause to be suspected in a young patient.

Other local causes can be classified as:—

(1) Inflammatory causes, Endometritis both acute and chronic metritis, Inflammatory condition of the adnexa.

(2) Benign, tumours-fibroids, fibroadenoma; mucus polypus and Endometriosis.

(3) Malignant tumours, Carcinoma of cervix, and body, sarcoma, chorionepithelioma.

(4) Displacements, Retroversion of the uterus and chronic inversion of the uterus.

(5) Tumours of the ovary causing increased abdominal pressure.

There is only one class of patients who bleed profusely but in whom there is no evidence of any pathological condition in the pelvis. Such condition is known as Metropathia Hæmorrhagica. Such patients are usually elderly, women age varying from 32 to 40 years. There is sometimes a history of amenorrhoea of some

months and then the bleeding starts. The bleeding may be continuous or there may be a short interval between the attacks.

There is usually no evidence of any gross changes with pelvic organs. The uterus may be a bit bulky. The curettage does not throw any light. There may be only some hypertropic condition of the endometrium. It has been proved that such bleeding is due to disfunction of the ovaries which in turn is due to disturbances of the anterior pituitary gland.

Treatment.—Treatment will depend upon the cause. If bleeding is due to any general disturbance, the root cause must receive proper attention. In cases of high blood pressure, the bleeding being an attempt on the part of nature to lower the blood pressure, no drugs which will tend to increase the pressure *e.g.*, pitutrin should be given. Bleeding due to fibroids will need surgical treatment. Cancer of the cervix if early can be more efficiently treated by operation. Radium and X-Ray also have been successfully used for cancer of the uterus.

Metropathia Hæmorrhagica needs careful and skilful treatment. In old days all the known styptics and other drugs having direct action on the uterus were used, *e.g.*, Ergot, Hydrastis, Cotarnihe Hydrochloride, Calcium Lactate, Pituitrin. These may be given a trial in the early stage. Hot douche, Vaginal plug may have to be used as emergency measures. Injections of Prolan, and Corpus luteum have been used with success. In some cases exhibition of thyroid also has met with marked relief in a few cases. With advance in our knowledge of endocrinology, it may be hoped that this class of patients may be treated with greater certainty and efficiency in this type of bleeding. Curetting may give relief but only for a short time. Bleeding sometimes is alarming and may threaten the life of the patient. Most of these cases need either operation or radium or X-ray treatment. In patients below 40, operation hysterectomy is the ideal treatment as X-ray or radium by acting on the ovaries leads to alarming symptoms of premature menopause. Patients over 40 may preferably be treated with radium or X-ray.

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BLOOD GROUP TESTS IN FORENSIC MEDICINE*

BY

D. V. S. REDDY, M.B., B.S.,

Vizagapatam.

THE publication of Dr. Schiff's monumental work(1) on blood groups in relation to biologic descent, heredity, anthropology, and criminology has again focussed our attention on this subject. The following is a list(2) (adapted from Schiff and Herzog) of blood group tests in medico-legal practice.

I. Civil Life:

(*a*) Establishment of non-paternity to

(1) disclaim any responsibility for payment of offspring in wedlock;
(2) avoid marriage;
(3) exonerate the accused;
(4) prevent perjury;

(*b*) To exclude false claimant to estate;

(*c*) In divorce or annulment proceedings to

(1) prove adultery;
(2) to declare a child illegitimate;
(3) for annulment if child is born before time;

(*d*) Establishment of non-paternity or non-maternity to exclude substitution of babies.

II. Criminal:

Identification and checking of groups of the stains discovered with those of the victim or accused.

(*a*) murder;
(*b*) robbery;
(*c*) assault;
(*d*) rape;
(*e*) kidnapping;

It is thus possible to eliminate innocent suspects in matters affecting life and death.

Civil Life.—The earliest studies on blood groups in families were published in 1908 by Ottenberg and Epstein. There are at

* Specially contributed to the 'Antiseptic'.

present three different views on the inheritance of the classical blood groups :

(1) Durgern and Hirschfeld put forward the hypothesis that there are two factors *A* and *B* which follow Mendelian laws of inheritance. But this theory is not deemed correct because of the small number of *A B* group.

(2) Bernstein and Farhata pointed out that *A* and *B* are not inherited independently but that their heredity depends on three allelomorphic genes, *A*, *B*, *O*, factors. Any group *AB* child cannot have a group *O* parent and a group *O* parent cannot have a group *AB* child. This theory is mathematically correct and serologically has been found to hold true.

(3) Bauer postulates two linked factors with 11% of crossing over.

Later, the presence of these two agglutinogens *A* and *B* was demonstrated in all tissues and excretions (except feces).

In 1927, Landsteiner and Levine discovered 2 new agglutinogens, *M* and *N*, which also are inherited as simple mendelian dominants. These are independent of *A* and *B*, exist always in homozygotic formula XX or in heterozygotic type XX where X is the dominant and X is the recessive corresponding to the genotypic formula.

Relying on the two factor hypothesis of Hirschfeld, Ottenberg published a table for deciding whether a certain child was a legitimate one or not. If the child's blood group belongs to the correct group, one may say that the child is legitimate but it need not necessarily be so. On the other hand, if the child's group is wrong for the accredited parents, one can positively say that the child must have one parent other than the alleged. These tests are of no value in establishing positive paternity of the child.

G. C. Dockray (3) states that if the blood group test indicates that the father is not the accused in medico-legal cases, there is no doubt of its accuracy and that in Germany, where this test is recognised, 8 % of the putative fathers have heen acquitted as a result of this test. The newer knowledge of *M* and *N* agglutinogens is now helping to narrow the field yet further. Landsteiner(4) draws attention to the *M N* elements in human erythrocytes, to the methods of demonstrating them serologically, and their medico-legal importance. Alexander, S. Weiner (5) reports two cases

illustrating the use of these two new agglitinogens in the determination of paternity. In both cases, the classical agglutinogens *A* and *B* did not throw any light in tracing the paternity of children. On reference to *M* and *N* agglutinogens, the distribution of these in the parents and children at once gave a reliable clue to the solution of the mystery.

Criminal Proceedings.—F. Schiff (6) discusses the value of an accurate determination of blood groups from blood stains. K. H. Berger (7) writes on the determination of blood groups from polluted stains. G. Strasmann (8) tackles the question of blood group determinations in cadavers.

Expert evidence on these tests is widely accepted as admissible in courts in America, and on the continent (Austria, Germany, Denmark, Sweden, Italy, Russia, Poland). In England, these tests are not yet fully recognised. There does not seem to be any reference to the practice of these tests at present in India.

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(1) Die Blutgrupen undihre Anwendunsgebiete ; Berlin ; Julius Springer, 1933.
(2) Indian Medical Record, Jan. 1933.
(3) Irish Jour. of Medical Sciences, April '32 ; 163.
(4) Med. Klin. 29 ; 6—9, Jan. 1st '33.
(5) Amer. Jour. of Medical Sciences, CLXXXVI ; 257, 1933.
(6) Manatschr. f. Krim. Psychol, 23 ; 735—738 ; 1932.
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Cases and Comments

ANGINA PECTORIS AND CORONARY THROMBOSIS

BY

DR. J. N. GHOSAL, L.M.S.,

Basirhat.

TRUE Angina Pectoris and Coronary Occlusion cases are rarely met with in mofussil practice ; the writer has notes of 9 cases of the first and 5 of the latter in his 31 years practice. Pseudo Angina cases and Effort Syndromes are more commonly met with however. Disease of the Coronary Artery and Coronary Occlusion are lately being studied minutely and the writer is presenting a few cases from his practice illustrating types met with in Bengal.

Causation.—The exact etiology of Angina Pectoris is not yet definitely solved. The latest two views are: "True anginal

attacks are the result of acute infarction of the myocardium from coronary occlusion. And coronary thrombosis is a complication of arterial disease and therefore only a terminal event in angina." (Parkinson and Bedford). Wenchback holds that probably the last phase in angina is anoxemia of the myocardium and that this occurs from a variety of causes. He asserts that the pain is due to an arterial stasis and distension of the arterial lumen. "The relief of this stasis is only possible by opening the peripheral circulation, as occurs naturally with the depressor reflex, or in disease, by the action of nitrites, quinine or warmth, or, from failure of the muscle of the left ventricle. This also explains the disappearance of the anginal paroxysm with the onset of cardiac failure."

(The 9 cases mentioned belong to the True classical Angina Pectoris type and not mere cases of Cardiac pains. The most noticeable features in these cases were: 1. Complete freedom from chest complaint between the attacks; 2. The individual attacks never lasted for more than 15 to 20 minutes at a stretch; 3. Absence of Heart disease or history of Syphilis. It will be noticed that none of the three modern theories of the pathogenesis of Angina Pectoris cover these cases. The first view,—Coronary Spasm or Obstruction does not satisfy most of the critics. The Aortic Disease theory, arteriosclerosis or syphilitic aortitis,—cannot be applied in the writer's cases. The theory of Exhaustion of the Myocardium cannot explain the irregular and uncertain period of attacks.)

Effort Syndromes

Pectoral or sternal pains provoked by an increase of demand on the heart muscle and relieved by rest, and Pseudo-anginal pains, are met with in practice often, but these cases seldom get the characteristic paroxysmal pain or suddenly die in the midst of an attack.

In Thrombosis of the Coronary artery, the 3 characteristic signs are :—severe, lasting, retro-sternal pain, dyspnœa and orthopnœa, and a previous history of constricting cardiac pains on efforts etc. All these signs were present prominently in the writer's cases. Recent studies indicate that the brunt of the disease falls on the left ventricle and the failure of the heart is always of the left ventricular type.

All the writer's cases belonged to the educated middle classes without any alcoholic or syphilitic taint in their families. During the interval of the attacks, all of them led comparatively comfortable lives. The attacks had been sudden, but often precipitated by slight over-exertion or anger. Clinical diagnosis of the two affections had been palpable, the anginal attacks never lasted for more than a few minutes, whereas coronary affection had been a

porlonged affair. An attempt is made here to differentiate between Angina Pectoris, Pseudo-Angina and Coronary Occlusion :—

	ANGINA PECTORIS.	PSEUDO-ANGINA	CORONARY OCCLUSION
Age	Males above 40	Females predominate	Past middle age
Onset	Often follows exertion, emotion, anger, heavy meal, exposure to cold	Spontaneous, often nocturnal or periodical.	Not precipitated by effort; often during rest or sleep
Attitude	Rigid, motionless, sitting, perspiring, fearing instant death.	Restless, moving, complaining	Restive, panting, anxious, blue, collapsed.
Pain	Excruciating, constricting killing pain in the chest, refers to the mid-sternum; radiates to left shoulder and arm.	Numbing, or, burning pain without constriction; refers to the throat or pit of the stomach.	Continuous squeezing pain for hours and days; sometimes intermittent; refers to sternal end
Duration	Lasts minutes only	Lasts 1 or 2 hours.	Lasts hours and days
Pulse	Unchanged or slow	Slight increase	Small quick pulse
Heart	Normal; feels constricted	Normal; feels distended	Distant weak first sound; irregular rhythm
Blood Pressure	Normal or slight increase	Lowered tension; soft arteries	Low B. P. inspite of arteriosclerosis
Vomiting	Absent	Occasional	Frequent
Dyspnœa	Comes late. A death like feeling prevails.	Shallow increased respiration	Severe dyspnœa and orthopnœa from beginning to end,
Temperature	Normal	Normal	Fever follows
Congestive Failure	Absent	Absent	Shock, cardiac pain and signs of heart failure
Relief	From Nitrites and morphine. Atropine, Adrenalin, Venostat.	Smelling salt; sedatives; ammonia, valerian; Hoffmanns Anodyne.	No relief from nitrites; repeated Morphine; Oxygen; avoid stimulants.
Prognosis	Rarely fatal in the first attack. But death certain in 1 to 10 years, usually from such an attack	Cure	Sudden death; or, Prolonged Pain & Shock; or, Prolonged Dyspnœa and Orthopnœa without much pain; or, Recovery in mild case.

Cases :—The writer's cases were all above 40 when they were first attacked, all belonged to the educated class,—12 Hindus and 3 Moslems, and none lived for more than 9 years from the onset.

(1) Mr. C. Superintendent of M. got his first anginal attack 5 years before death. His last but one attack took place in the writer's presence. " He was then staying only 20 yards from my office. I was sent for within a minute of the attack at about 8 p. m. Before I had crushed an amyl nitrite capsule, he became absolutely blue, breathless and pulseless and dropped on the lap of a friend apparently dead ". The writer quickly introduced half c.c. of adrenalin sol. into his cardiac muscle and held the broken scenting capsule into his gaping mouth back to the throat. Artificial respiration was carried on by Dr. Bijoy. About 5 minutes elapsed in grave suspense. Then the dark face covered with big drops of sweat quivered and a feeble gasp greeted us with cheer. His heart started beating, at first with long intervals between the beatings,—4, 6, 8, a minute, the respiration following similarly. The gentleman recovered sense quickly and complained of acute pain within his heart and left shoulder joint, for which morphine gr. $\frac{1}{4}$ was injected. This afforded him speedy relief and sent him asleep ".

Inspite of grave warning and request, he went to his place of buniness at the Sunderban Abad to finally adjust his accounts and died there from a similar attack in 5 years.

(2) Mr. K. M. a Homeopath of B, got his first anginal attack at the age of 51 and the last at 58. Altogether he had about 6 major attacks and a few minor ones. The writer attended him on 2 occasions and his was a typical case of angina pectoris of classical description. Amyl nitrite capsules and tabloid nitroglycerine had been his constant companion for these eight years. Only once he had to take a morphine injection for the pains. He got the fatal attack immediately after his night meal. The coat containing the elixir of his life was sent for from the first floor and when this was ready for his nose, he was breathless and without a doctor to help him.

(3) His next brother, at the age of 56 one day felt heart-ache, got the hint, gave up the arduous duties of a railway overseer, returned home and settled as a gentleman at large. He lived for about 5 years in health with occasional minor anginal pains and dyspnœa,—always precipitated by anger or irregular and heavy meal to which he was habituated. His last illness commenced with fever, cardiac pain, dyspnœa and emphysematous breathing. It resembled more of the nature of coronary thrombosis than anything else. For 4 days he struggled a life and death fight with increasing breathlessness, cyanosis, quick-irregular-fluttering pulse. And amidst all his sufferings, he used to point out and locate the heart, especially near the apex, as the seat of his trouble and pain. Nothing could afford him any relief.

(His wife died about 3 years after from a similar attack within 5 days. She was a fatty healthy lady. Her last symptoms resembled closely a severe attack of asthma with slight fever. Pneumonia was suspected by the attending doctor but there was no dulness anywhere and the lungs were free from consolidation or crepitations, wheezing rhonci predominating at the end with emphysematous breathing. Dyspnoea and orthopnoea were the main signs. Adrenalin, ephedrine, morphine, atropine, oxygen,—all failed to afford her the slightest relief. She could not lie down for a moment day and night and panted sitting all the while. At last she became extremely blue and cyanosed, collapsed and died.)

(4) The third brother died very suddenly in Calcutta at the age of 56 from heart failure. Two years before his death, he had one day felt severe cardiac pain, resembling that of his brothers,—lasting for a few minutes and was warned to live a regular quiet life eating sparingly. The writer had examined his heart and found nothing suspicious. His blood pressure was read. 145/95. Lately he had been greatly troubled with worry and anxiety but never felt any difficulty in pursuing his avocation. On the fatal night he had retired quite hale and hearty. "At about midnight he awoke, went to the privy next door, returned, sat on the bed, felt a sudden sensation of suffocation and said something has snapped or gone fatally wrong, caught hold of his chest with both hands, panted and dropped on the bed." Doctor arrived within 20 minutes and found him dead.

Familial Angina

The 3 brothers died one after another from almost similar affection. The first brother had unmistakable angina pectoris and

died in an attack within 10 minutes. The second brother complained of minor cardiac pains on several occasions; but his last attack lasted 4 days and resembled all the signs of Coronary Thrombosis. The third brother was not diagnosed, but the history of previous cardiac pains and the suddenness of his death indicate similarity in the affection. The analysis of these 3 cases and of the other anginal cases brings us near the Coronary Artery Disease theory and reminds us about the close connection between angina pectoris and coronary occlusion.

Angina in a Diabetic

A Mahommedan gentleman had been a diabetic for a long time. He got a typical attack of angina pectoris one night after meal but managed to survive. Before he had fully recovered from weakness he got a second attack after 8 days and died unattended and suddenly.

(In this connection rare cases of anginal attacks following injection of Insulin for diabetes,—mentioned by Katz,—should be remembered. Ergotamine Tartarate has been said to precipitate an attack. Epinephrin has been found to bring on an attack in those subject to angina,—when subcutaneously injected in dose of 1 c.c.)

Coronary Thrombosis

The writer had the unique experience of listening to an embolus moving within the auriculo-ventricular cavity of a patient-like a shuttle flying from one cavity to another, with the rhythm of the heart. The gentleman was a diabetic who had been operated upon previously by the writer successfully for a big carbuncle on the back, and who was at that time suffering from extensive cellulitis of the thigh and gluteal regions. The patient was in extremis and nothing remained for him to do. But he was fascinated with the novel sound in the heart and stayed there to see the end, which the writer predicted to be near. Almost an hour passed in this way, the patient actually falling asleep in the meantime. He did not feel any pain or dyspnœa on account of this floating clot within his ventricle. Indeed the writer's prediction was taken lightly by all present there. After a light sleep the patient called the writer and asked permission to smoke, as he was feeling better. He was allowed to smell and taste the smoke but not to draw deep. He did so and went to sleep again. After quarter of an hour more, the patient suddenly turned, looked widely, shivered, panted, gasped and died with wide mouth. The

clot evidently reached its destination tightly closing the mouth of the coronary artery and the engine stopped with a sudden thud.

The above case illustrates the journey of a big clot from its origin to destination. Its action is tragic, and before any signs of decompensation appear, death takes place. Where tiny infarcts block or narrow small branches of the coronary artery, it has been experimentally studied that, that portion of the cardiac muscle becomes ischemic and the characteristic pain appears. Disease of the coronary vessels may also bring about ischemia. The big aorta may be similarly diseased and manifest anginal pain.

Pseudo - Angina

Besides hysteria, the following may simulate anginal pains and are often met with in practice:—tracheal acidity with burning in the œsophagus; peristalsis or spasm of the œsophagus; cardio spasm; acute or even chronic dilatation of the stomach; gastric ulcer of the lesser curvature and of the left side; acute cholecystitis or pancreatitis; pleuritic pain.

(It is not an uncommon experience amongst elderly men, especially those who give up physical exercise and live an inactive life but all the same indulge freely in dainties and spiced dishes, to get suffocative feelings followed by breathlessness after the meals. Sometimes a globus or a desire but inability to get rid of gas or acid fluid causes a sense of impending heart failure. Occasionally an excruciating Anginal pain is felt, which is attended with sweating, a feeling of exhaustion, and a fear of sudden death. A reflex pouring of saliva into the mouth, the swallowing of which gives temporary relief, is a sure indication of the stomachic origin of the trouble. Immediate relief is obtained by vomiting with the help of two fingers within the throat or with warm salt and water.)

Treatment of Angina.—The old remedies, Nitrites and Morphia, are still the sheet anchors of the profession, during an attack. In cases of extreme pain and shock, it is advisable to inject half a grain of morphia and at the same time use nitrites. Amyl nitrite, nitroglycerine, sodi nitrite are commonly used. In mild attacks, stock preparation of-Spt Ammon Aromat, Hoffman's Anodyne and Liq Trinitrini may be of relief. "A mouthful of Whisky has been the favourite of some". Atropine, by cutting off the vagus irritation on the heart, and Adrenalin, by dilating the coronary vessels or by stimulating the accelator to overcome vagal reflex, have been recommended.

Livingstone's Ergot Solution has been recommended. It is prepared by dissolving 1 dram of solid extract of ergot in 1 oz. of sterile distilled water and then filtered; 3 minims of chloroform

and 3 grs. of chloretone are then added. Dose:—15 to 30 minims hypodermically.

Lacarnol or extract of skeletal muscles, hypodermically in 1 to 2 c.c. dose every day, or by mouth, has been given an extensive trial recently. In mild cases of cardiac pain it relieves chest pains completely from 2 to 4 days after each injection; but in severe cases it is of no use.

Venostat—is said to afford instant relief in angina pectoris, cardiac asthma, etc. The principle is to stop the venous circulation of the extremities, pool the blood in the venous and capillary reservoirs and thus relieve the distressing syndrome. In grave anginal cases, where the life and death struggle lasts for minutes only and where congestion plays no part this proceedure does not appeal.

(The instrument is a combination of 4 cuffs of the Tycos Manometer with 1 indicator and insufflation bulb. Diastolic pressure is maintained in the cuffs for 10 to 30 minutes. Four rubber tubes may be substituted and used in the way intravenous injections are given.)

Aconite.—"In a case of severe anginal pains brought about by the throbbing of an aortic aneurism, 5 drop doses of Tr. Aconite gave great relief by lowering the blood pressure and quieting the heart".

Between the Attacks.—Pot Iodide, Nitroglycerine, Theobromine and its preparations, Sodi Caccodylas, Arsenic (specially in syphilitic aortitis), Roger's and Beebes Adrenalin Residue, are recommended.

Angioxyl—a pancreatic extract, has been introduced by Vaquez: 10 to 40 units are daily given by injection, irrespective of high or low blood pressure.

Glucose Injections intravenously in gradually increasing strength and dose, 1 to 20 p.c.,—30 to 150 c.c., thrice a week,—have been recommended. Strophanthin or Theobromine Ethylenediamine may be added occasionally.

Stovaine Injection, 10 c.c. of a 1 p.c. sol. under the skin wherever the patient points out perepheral pain, twice a week, gives relief.

Alcohol.—Paravertebral injection for the relief of cardiac pain is recommended in severe cases.

Prophylaxis

Balfour recommends the value of a Dry Diet in all cases of senile heart. He mentioned four important rules;

(1) There must never be less than 5 hours between each meal.
(2) No solid food should ever be eaten between the meal.
(3) All those with weak hearts should have their principal meal in the middle of the day.
(4) All those with weak hearts should take their meals as dry as possible.

The victims of angina are everywhere advised to avoid chill, exertion, heavy meal, tobacco, etc., although the attack heeds none and follows no law. Most of the writer's patients were intelligent and careful men never running to excesses. The attacks usually occurred when they were in the best of their health.

Tobacco Angina

Tobacco causes præcordial pain in many persons but this pain seldom goes to the severity of an anginal attack. But patients suffering from real anginal attack are certainly affected by tobacco. Instances are recorded where total abstinence from tobacco improved the patients greatly, and the renewal of it, brought about fatal attacks.

Pseudo Angina

Here emotional and nervous elements are always present and therefore Hoffmann's Anodyne with Ammonia and Valerian are beneficial. Livingstone's Ergot sol. is also good. Hypodermically Strychnine is useful between the attacks.

For the increased vasomotor irritability, especially in the "Heart Attacks of nervous women approaching the Menopause", H. Curshmann prescribes,—Quinine sulph. dr. 1, Ext. Pulv. Valerian q. s. divide into 40 pills,—4 to 6 pills a day. In serious cases and for elderly patients, Nitroglycerine can be given in addition. Bromides and mild hypnotics are also useful.

Coronary Thrombosis

Four clinical varieties are recognised:—

(1) Instantaneous death. Nothing helps.
(2) Death after few hours.
(3) Death delayed for days.
(4) Recovery in mild cases, with symptoms like slight præcordial pains, ordinarily rarely recognized, due to obstruction in the smallest branches of the coronary arteries.

Treatment.—Morphine is the only palliative in severe cases. Where morphia fails light Ether anaesthesia may be tried. In prolonged cases with fluttering pulse, Caffeine Sod. Benz. Strophanthin or Adrenalin, intramuscularly may be carried out. Keep the patient warm and under Oxygen tent.

Oxygen Treatment of Coronary Thrombosis: Oxygen has been found life saving in this disease by Barach and Levy. It relieves pain, restlessness and dyspnœa,—the 3 prominent signs. The heart gets steadier and the pulse stronger; the ashy colour of the face vanishes with a return of oxygenated blood. Indeed within 1 to 3 hours after placing the patient within the oxygen tent, the dying coronary patient seems to return back to life. The degeneration of the affected muscular fibres of the heart is checked and in mild cases a regeneration seems to take place and a permanent cure may be effected. But it must be remembered that to effect such a miraculous recovery, the patient should be placed in the specially constructed Oxygen Tent improvised by Barach, at the earliest opportunity, before any extensive damage has been done to the cardiac muscles, and there he should stay for hours till the change is permanent.

They claim amelioration of Anginal Pain also under their Tent but the short duration of the paroxysm in Angina Pectoris and the dearth of Tents are practical difficulties.

Lastly, E. S. Kilgore draws attention of the practitioners about the right diagnosis of many cases of so-called "ptomaine poisoning, acute indigestion, pleuritic pains, neuritis, etc.," in middle aged persons where possibly there have been "occlusions of small branches of the coronary artery." The treatment should be Rest, which should be enforced even when the infarcted area may be small with little symptoms, for at least 8 weeks, to permit firm healing. *Morphine and Oxygen* are both analgesic and should be used more often than are at the present moment done. *Digitalis is only indicated* when actual fibrillations or congestive failure occur. Besides Oxygen, Caffein and Epinephrin or Euphyllin and Theobromine Sodi Salicylate are recommended for the first 10 days, on account of their dilating effect. Dextrose is strongly recommended for strengthening the cardiac muscle and should always be given in small repeated doses. Concomitant diabetes or syphilis should be neglected for the time being.

THE ACRIFLAVINE TREATMENT OF BURNS

BY

BHAVANISHANKER H. PATHAK, L.C.P. & S., (BOM.),

Karamsad.

IT is during winter that doctors practising in villages or small towns get most of their cases of burns. Though they know all about the recognized tannic acid treatment of burns, they find that method nearly impossible to adopt for want of proper facilities; and treat their cases according to the out-of-date and unsatisfactory methods. I believe that the acriflavine treatment of burns will interest all, and specially those who have to face the above inconvenience.

This form of treatment consists in using a "1 in 1000 emulsion of acriflavine in pure sterile medicinal paraffin. It is applied freely on lint to the burned surface, after removal (if indicated) of the causative agent. It is non-toxic and is painless and quite harmless to the skin, conjunctiva or any mucous surface. Under its influence burns remain clean, free of all septic infection and supple without the usual tendency to scarring and contraction. There is no hard scab as with tannic acid and none of the disadvantages of ointments which cake and clog the wound. Any blisters present are freely opened and dried with a gauze swab, the dead epithelium dissolving and disappearing in the emulsion instead of having to be cut away as is the case with most other dressings.....Even in extensive burns, there has so far been no sign of any toxic effect from the free use of this compound. It is considered as by far the most satisfactory burn dressing".

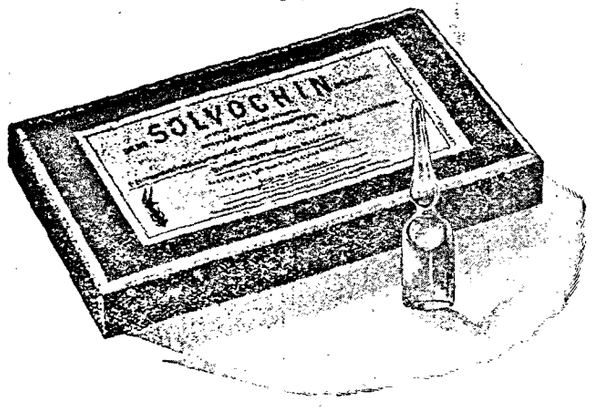
Mela Shindha, a Harijan boy of 6 years was badly burnt on one cold morning while sitting before a fire with clothes on. Practically whole right half of his body was burnt. Most of this extensive area presented a combination of 2nd and 3rd degree of burns; while in the axilla and the pectoral region muscles also were partially involved.

He was brought to me on 6th December 1933 *i.e.*, five days after his receiving the injury. There was an offensive smell of decomposing tissues, and on my removing the rag I found the wound full of all possible septic material. It was an offensive smelling dirty wound on which was dusted powdered coal of some herbs, and fairly big maggots were found actively moving in. Some maggots had burrowed their way in the tissues.

I picked up all maggots and such dead and dirty stuff as could easily be removed and touched pure phenol to the sinuses in which small maggots were found and their larvæ suspected. After this light cleansing of the wound, Acriflavine Emulsion was applied to the whole surface and then the usual dressings. Next day to my delight I found the remaining dead tissues dissolved and the burnt area presenting a fairly clean appearance. There was not the distressed look of the previous day and the temperature which used to remain elevated was normal. For the first three days an occasional maggot or two were found in the wound and the suspected sinuses touched with pure phenol. Later on nothing else but acriflavine emulsion was used. For the first few days I used to change the strength of the emulsion. Any strength from 1-500 to 1-1000 was good enough. In about a fortnight's time 2nd and 3rd degree burn was completely healed. It was the pectoral muscle and the axilla that took fairly a long time *i.e.*, about two months to heal.

I told one of my friends to try this treatment; and he spoke of it in high terms. Lately he had a case of 2nd and 3rd degree burn of right upper and lower extremities of a young woman. He was pleased to find that the parts remained dry as there was no oozing, aseptic condition and painlessness were maintained and recovery was rapid.

Dr. Mummery has been using acriflavine emulsion for the past two years or so "to the exclusion of other forms of treatment." My experience of this treatment—though not wide as yet—is certainly pleasent and encouraging.



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Editorial

THE FEMALE SEX HORMONES

ENDOCRINOLOGY is now recognised as one of the most important branches of medicine. No one now questions the great influence of the glands of internal secretion on important physiological processes. During the last decade increasing interest has been manifested in the study of the organs of internal secretion and their function. Probably more work is carried on in this field than in any other branch of medicine, especially in relation to sex and the internal secretions. It will therefore be not out of place to give a resume of the female sex hormones and the probable way they act. Much is theoretical and even hypothetical but what little we know is based upon animal experimentation and to a lesser extent on human clinical application.

The glands and structures that elaborate secretions which influence sex function are the anterior pituitary, the gonads and possibly the placenta with other glands such as the posterior pituitary, the thyroid, the adrenals &c., having an indirect and minor role.

The anterior pituitary, according to Zondek, elaborates a growth hormone, a follicle ripening hormone called Prolan A, a luteinizing hormone called Prolan B, and a metabolism hormone. Prolan A normally stimulates Graafian follicle development and Prolan B, after rupture of the ripened follicle at about the fourteenth day, promotes the formation of the corpus luteum. That these hormones do not act directly upon the uterus is

evidenced by the fact that in castrated animals, its administration has no effect upon the uterus.

From the standpoint of endocrine physiology, the ovary can be considered as a double gland. The follicular apparatus with its hormone folliculin constitutes the female sex gland proper. The corpus luteum with its hormone progestin is an accessory gland concerned with pregnancy. It is now conclusively proved that there are two hormones in the ovary, the one of the follicle called oestrin, a growth substance having its specific influence during the proliferative stage of menstruation, the other of the corpus luteum called progestin, having the specific function of sensitizing the uterine mucosa for nidation of the ovum and its maintenance. These two hormones oestrin and progestin are antagonistic to each other in their effects on the uterus but at the same time they are synergistic, *i.e.*, they produce by combined action an effect which neither could produce when acting alone. This can be clearly explained thus: "The function of the follicular hormone seems to be that of putting the uterus in the proper physiological condition so that it can respond to the corpus luteum hormone. Neither of these substances can produce progestational proliferation in the castrate uterus when given alone; if, however, it is brought into the condition typical of oestrus through the injection of the follicular hormone, and is followed immediately by corpus luteum treatment, progestational proliferation follows."

The main site of the production of folliculin (*oestrin*) is in the unruptured Graafian follicle. It is also produced to a small extent by the placenta and corpus luteum. It is found in amniotic fluid, and in the cord blood and liver of the foetus. Ascheim and Zondek found that the urine of pregnant women contains large quantities of the follicular hormone. Doisy using such urine was able to isolate the follicular hormone in crystalline form. This substance was named Theelin by Doisy and is of great potency. Progestin is elaborated only by the corpus luteum. The corpus luteum according to recent researches, contains two other hormones, lipamin, which promotes the growth of the uterus and luteo-lipoid, which checks menstruation. Various other hormones have been described and named as corporin, relaxin etc., but it is very doubtful if they are different from the hormones described above.

The placenta is becoming more and more regarded as a "ductless gland of pregnancy". It is both a storehouse and a producer of substances necessary for the nourishment and growth of the foetus. Ascheim and Zondex in 1917 found both an

oestrogenic (folliculin) and an anterior lobe hormone in the urine of pregnant women. Doisy, Veler and Thayer, as mentioned before isolated the crystalline follicular hormone. They named it as Theelin. A second substance Theelol was also found. In the course of finding out the distribution of this theelin it was discovered that large amounts were found in the placenta. At full term a placenta weighing between 500 and 700 grams may contain as much as 1000 rat units of Theelin. It has been found that it appears in the foetal membranes in the third month and reaches a maximum towards the end of gestation. With regard to the 'anterior lobe hormone' found in the placenta it is not very definite as to whether this hormone is simply stored in the placenta after being formed by the hypophysis, or whether the placenta alone furnishes it or whether the placenta only assists the hypophysis in supplying the extra amount required during pregnancy.

We may next consider the effects of these researches on the modern conceptions of the onset of puberty, menstruation, parturition and lactation.

Zondek, Ascheim and Smith have all demonstrated that the onset of puberty is an anterior lobe pituitary effect. As a result of the pituitary activation, a sudden increase and speed of follicle ripening takes place, complete maturation of, at least, one follicle occurs with rupture and consequent ovulation, resulting in corpus luteum formation. If no pregnancy occurs, the corpus luteum involutes and regresses, ultimately forming a corpus albicans. If pregnancy has taken place the corpus luteum persists till the end of pregnancy. No explanation however is offered as to why the pituitary at this time suddenly increases its activity.

With regard to menstruation and its mechanism, our knowledge has been very well summarised by H. L. Finkel. The anterior pituitary follicle ripening hormone (Prolan A) stimulates maturation of the Graafian follicle. The maturing Graafian follicle produces a hormone (oestrin or folliculin) which acts upon the endometrium and stimulates it upto the so-called interval stage—the tubular glands becoming hypertrophied and tortuous. As the follicle matures, it distends the surface of the ovary. Under the influence of the "B" hormone of the anterior pituitary (Prolan B.) the follicle ruptures, discharges its ovum and is transformed into the corpus luteum. This process of ovulation occurs in the midinterval between two periods or about 14 days after the onset of the previous menstruation. The production of Theelin or

folliculin or oestrin is continued in the corpus luteum. The corpus luteum now begins to secrete progestin. This stimulates the progressive growth of the endometrium during the second half of the menstrual cycle. It gives rise to the progestational endometrium. The next step is the inhibition of the anterior pituitary secretion. While some writers think that the increase of Theelin in the circulation is the cause of this involution others think that progestin is the cause. Anyhow the withdrawal of the pituitary stimulus results. The corpus luteum retrogresses. Theelin and progestin are withdrawn. The endometrium built up to the pre-menstrual phase, suddenly relieved of all endocrine stimulation undergoes a haemorrhagic disintegration (menstruation). The inhibition of the anterior pituitary gland being now removed as a result of the disappearance of Theelin and progestin, the 'A' hormone again becomes active, and a new cycle is started.

The picture is slightly different in pregnancy. If after the extrusion, the ovum becomes fertilised, the collapse of the corpus luteum and endometrium does not take place. The corpus luteum grows larger and larger and continues its hormonic influence on the endometrium. Ascheim and Zondek found that in early pregnancy there is a relative excess of the anterior lobe pituitary hormone over the ovarian, whereas this position is reversed in the later months. It has been suggested that this change in the hormonic balance is probably concerned with the onset of labour. It has also been shown that there exists an antagonism between the internal secretion of the corpus luteum and the posterior lobe of the pituitary with its oxytocic principle. It is also known that there is a synergistic effect between folliculin and oxytocin. During pregnancy therefore, the action of the posterior lobe secretion in causing uterine contraction is inhibited. Just before delivery the outstanding endocrine situation is as follows: — folliculin has reached its highest level, the luteanizing hormone has decreased and the corpus luteum apparently has become insignificant. With the disintegration of the corpus luteum, oxytocin acts on the uterus already sensitized by the oestrin and brings on labour.

The mammary gland is also under the control of the ovary and anterior pituitary. Theelin is responsible for the development of the breasts that takes place at puberty. Progestin also has a stimulating action on the breast. During pregnancy the breast undergoes still further stimulation from the prolonged action of theelin and progestin. A few days after parturition, lactation sets in. There is good reason to believe that this is not due to folliculin or corpus luteum as formerly supposed but due to a special lactation hormone produced in the anterior lobe of the pituitary.

The question of greatest interest to practitioners is, what are the practical applications of these discoveries. Various tests for the diagnosis of pregnancy have evolved. Of these the one invented by Ascheim and Zondek is used universally with uniformally good results. The test depends upon the presence of prolan B, the luteanizing hormone of the anterior lobe of the pituitary in the urine of pregnant women, which when injected produces characteristic changes in the ovaries of laboratory animals. A positive reaction consisted in production of corpora lutea or haemorrhagic follicles in the ovaries of tested mice at the end of four days. The test however, is now carried out on rabbits, in which the reaction requires only one or two days.

In the field of treatment, desiccated preparations and soluble extracts of whole ovary, corpus luteum and anterior pituitary, have for many years been used for a wide variety of conditions and many favourable results have been reported. These preparations are known to be physiologically inactive by the specific biological tests now available. But advances in the chemistry of these hormones have now yielded preparations of proved physiological potency. Folliculin or oestrin is now available commercially in the form of ampoules for hypodermic injection, tablets and capsules for oral use, and suppositories for vaginal administration. These are known commercially as Agomensin (Ciba), Progynon (Schering), Theelin (Parke-Davis), Varium (Burroughs-Wellcome), Unden (Bayer). These are much less effective when given by mouth so that considerably larger doses are necessary. Progestin is not yet available extensively. It is available only for hypodermic use, since it is inactive when given by mouth. Some of these preparations are known commercially as Lipo-lutin (Parke-Davis) Sistomensin (Ciba) and pro-luton (Schering.)

Numerous reports have already appeared on the use of these substances for a wide variety of conditions. They have been recommended for amenorrhoea on the one hand, and for menorrhagia on the other. They have been used for sterility on the one hand, and for contraception on the other. They have been used for hypogenitalism, dysmenorrhoea, frigidity, dyspareunia, pernicious vomiting of pregnancy and climateric symptoms. Pharmaceutical manufacturers are enthusiastic about their products and cite indications and dosage with an anthoritativeness which is

perhaps not always justified. As carefully controlled observations of the action of these substances in the human being are still scanty no definite opinion can yet be given. The prices of most of these preparations are very prohibitive. But a great future lies before this form of therapy and the results of further research have to be anxiously awaited.

References :—

1. *Finkel. H. L. New England Medical Journal 1933.*
2. *P. C, Das. M. B., I. M.G. 1933. page 39.*
3. *A. A. Werner. M. D. Illinois Medical Journal 1934 page 511.*

Gleanings from Medical Press

MEDICINE AND THERAPEUTICS

Epilepsy and its Treatment. — James Collier (*Practitioner of July, 34, page 37*). discusses the modern treatment of epilepsy and comes to the following interesting conclusions :—

(1) Advent of epileptic event is always fostered by inactivity of mind and body and warded off by activity. Therefore the old counsel of rest and quiet is now given up in favour of normal active life.

(2) Treatment of factorial conditions such as rickets and other nutritional faults, renal disease or hypertension should be done.

(3) When local lesions of the brain are present, operative treatment should never be undertaken for the relief of epilepsy.

(4) The diet should never be restricted in meat and protein foods nor in fats, and if any reduction is made it should be in the sugar and cereal food. A ketogenic diet and the production of a continuous relative acidosis is definitely valuable in young subjects.

(5) The medicinal treatment consists of the exhibition of luminal, the bromides and paraldehyde and in rare cases of zinc and belladonna. These drugs should be given before an expected attack. Three grains of luminal and thirty grains of bromide a day are the limits. Prominal is also very useful.

(6) Status epileptius in all its convulsive forms is very amenable to the paraldehyde treatment. It is given in four drachm doses for an adult in twice the quantity of olive oil per rectum. In very severe cases the nasal tube must be used to feed.

Sedatives such as chloral and bromide, luminal, opium and chloroform are worse than useless.

Lumbar puncture is imperative when albuminuria or any indication of impaired renal function is present.—U.K.R.

Relation of the Adrenal Cortex to Vitamins A, B and C.—J. E. Lockwood and F. A. Hartman, Endocrinology 17 : 501 (Sept.-Oct.) 1933.

Various studies have indicated a relationship between the endocrine glands and the vitamins. In order to study the influence of the extract of the suprarenal cortex, animals the suprarenal glands of which had been removed were placed on diets deficient in vitamins, and the time of appearance of symptoms was noted in those to which the extract was administered as compared with those not treated. Guinea-pigs were used in the experiments with vitamin C and rats in the tests with vitamins B_1 and A.

When given by mouth, the extract produced no effect ; when injected hypodermically, it improved the growth curve and caused less severe scurvy in avitaminosis C ; it improved the growth curve and delayed the onset of symptoms in avitaminosis B_1, and had no influence in ameliorating the symptoms in avitaminosis A. After single suprarenalectomy, the weight of the glands indicated hypertrophy of the glands in deficiencies of vitamins C and B_1 and atrophy in deficiency of vitamin A.

The conclusion is that cortin or some unidentified substance in the extract of the suprarenal cortex aids in the utilization of vitamins C and B_1, and it is suggested that an ample supply of these vitamins would be advantageous in cases of insufficiency in the suparenal cortex.—A.J.D.C.

Ileus Following Eating of Poppy Seed.—In two patients, a woman, aged 55 and a man, aged 63, with the symptoms of ileus, Zielke (*Deutsche medizinische Wochenschrift*, through *Jour. A.M.A.*) at first was unable to determine the cause of the intestinal

occlusion, but then it was found that both patients had eaten large amounts of poppy seed on the day preceding the onset of the symptoms. In the first patient the unsuccessful conservative treatment was followed by an operation, but the woman died as the result of peritonitis. In the second patient, who was observed several months later, the experiences with the first patient warned against an operative intervention, and this patient recovered following conservative therapy. The author thinks that either the ileus was mechanical, that is, produced by resorption of water and by swelling of the poppy seeds, or the alkaloid content of the poppy seed led to intestinal paralysis. Little is known about the toxicity of poppy seed, but it is usually assumed that the ripe seeds do not contain alkaloids. —*The Indian Eastern Druggist.*

Amyl Nitrite and Cyanide Poisoning.—Methylene blue has been shown by Sahlin, Eddy, Brooks, Hug, and Hanzlik to antagonize the action of cyanide in animals, and recently it has been successfully used by Geiger in the treatment of cyanide poisoning in a man. K. K. Chen, Charles L. Rose and G. H. A. Clowes, Indianapolis (*Journal A. M. A.*, June 17, 1933), investigated both methylene blue and amyl nitrite in cyanide intoxication and have found the latter to be more efficient than the former. It was found that the minimal lethal dose of sodium cyanide in mice by subcutaneous injection varied from 8 to 14 mg. per kilogram. In rabbits the minimal lethal dose was determined to be 2.2 mg. and in dogs 6 mg. per kilogram. Methylene blue given intravenously, in order to be effective in mice and rabbits, must be administered within a short time, ranging from five minutes before to one to two minutes after the subcutaneous injection of sodium cyanide. The maximal amount of the cyanide successively antagonized by methylene blue was twice the minimal lethal dose. In dogs, similar results were obtained when the dye, either in a single dose or by repeated injections, was introduced directly into the blood stream. No animal was protected by methylene blue medication against three minimal lethal doses of the cyanide. By the inhalation of amyl nitrite, dogs can tolerate four minimal lethal doses of sodium cyanide. One of two animals that received four and a half minimal lethal doses also completely recovered. Those that died from larger doses of the cyanide seemed to have a tendency to survive longer when treated with amyl nitrite. Experimentally the

efficiency of this drug in antidoting cyanide poisoning is thus at least twice that of methylene blue, and it possesses the added advantage of being readily administered by the respiratory route. The authors suggest that a rational procedure in managing a case of cyanide poisoning based on animal experiments might consist of (1) immediate administration of amyl nitrite for from fifteen to thirty seconds to be repeated every three to five minutes if the patient is unconscious and rigid; (2) gastric lavage at once if the poison is taken by mouth; (3) artificial respiration by hands in case of grasping while the administration of amyl nitrite is continued; (4) the frequent counting of pulse and respiratory rates, and (5) the continuous observation of the patient for at least the first twenty-four hours. During convulsions, the inhalation, of amyl nitrate may be prolonged to a minute or slightly longer. When respiration and heart rates show little or no abnormality, the administration of amyl nitrite should be reduced to once every several hours. To combat severe headaches that may occur, an analgesic with no depressive action on respiration may be employed.

Sudden Death from Dinitrophenol Poisoning: Report of Case with Autopsy.—Fenn E. Poole and Robert L. Haining,, Los Angeles (*Journal A. M. A.*, April 7, 1934), stress the fact that every one who has commented on the use of dinitrophenol has emphasized the importance of restricting its clinical trials to carefully selected cases under constant supervision. However, it appears that the compound is being widely popularized as a weight-reducing agent and is being bought and used with no competent direction. This seems highly deplorable in the present state of knowledge of human responses to dinitrophenol. Thorough and extensive animal experiments have been performed (notably by Tainter and Cutting and by Magne, Mayer and Plantefol) and the toxic effects and the fatal dosage for animals have been accurately determined. This work, however, must not be presumed on too freely in dealing with human beings, and it can have no value whatever in predicting or preventing the occurrence of severe allergic manifestations. There is no antidote for dinitrophenol poisoning. The only measures that have seemed to reduce the mortality in animals have been administration of fluids and cooling baths. In dinitrophenol-poisoned munitions workers, Mayer found that intravenous injections of dextrose constituted the most effective treatment. This seems rational because of the marked loss of tissue glycogen that has

been shown to occur. Morphine allays the excitement and the dyspnea and may check the rise in temperature, but it cannot halt the process of intoxication and, in dogs poisoned with dinitrophenol, morphine does not affect the mortality. In the case of sudden death from dinitrophenol poisoning that the authors report, the victim heard of the compound from a friend and bought and used it without competent supervision. A physician was not consulted until a few hours before death. The dosage in this case was high but within the presumed limits of safety, so the fatality should probably be regarded as an example of allergic idiosyncrasy. Before taking dinitrophenol, the patient had been taking desiccated thyroid extract, one-fourth grain (0.016Gm.) three times a day for about one year. The authors do not know whether or how this has significance.—*Medical World.*

SURGERY

Diagnosis and Treatment of Injuries of the Head.—Walter E. Dandy, Baltimore (*Journal A. M. A.*, Sept. 2, 1933), believes that absolute rest is the most important assistance that can be given in aiding nature's efforts to compensate for increased intracranial pressure. By careful and frequent bedside observations one can know at all times the state of intracranial pressure and can in most instances subtract the important group of extradural hematomas from the remaining cases. Conservative treatment adds not one iota to the later complications. When nature shows unequivocal signs of failure, the only remaining rational treatment is to provide more room by a subtemporal decompression, the effects of which persist through the illness. A decompression is used only in selected cases in which the patients have servived six hours or more and are then in decline—less than 10 per cent of all cases. The author is well aware of the fact that at no time have the results in treating cranial injuries been so bad as when ill timed and poorly performed decompressions were in vogue and in many places almost a routine. A general impression prevails that any one can handle injuries of the head, especially with the use of lumbar puncture and dehydration. On the contrary, there are few fields in which the most careful and persisting study and critical judgment are more necessary to attain the maximum results. Changes in the patient's condition frequently appear so quickly and the period in which favourable action is possible is so brief that life

may truly hang by a slender thread, the breaking or strengthening of which is dependent on the quality of the physician's care and skill. By quality is not necessarily meant specialists but experts—those using the best clinical judgment (which is usually dictated by common sense) and the best technical ability. In the late sequelae of cranial injuries, an accurate diagnosis is an absolute prerequisite to the required form of treatment. Excepting inflammations, they offer a high proportion of complete recoveries and with little risk.—*Medical Times.*

Pre and Post-Operative Treatment. — L. E. Barrington Ward, F.R.C.S., (*Medical World*, June 22, 1934) makes the following remarks on the Pre and Post Operative Treatment of abdominal cases.

Pre-operative Treatment.—He condemns the time-honoured method of administering a purgative, and opines it is the worst possible treatment. The author allows the patient to carry on his usual diet up to the day of operation. Starvation is not suggested; the only restriction of food, is to limit the quantity entering the stomach just previous to having the anaesthetic. No purges are ordered. In constipated individuals if the rectum is loaded an enema is given the previous day. The day before the operation the patient is fed with glucose. This will improve the patients' reserve and they will not be so sick after the operation. It is essential to see that the mouth is clean before any operation is done, and especially before any abdominal operation.

Pre-medication.—The writer always consults his anaesthetist as preanaesthetic medication is an individual fancy. The drugs in use are, Nembutal, Avertin, and Paraldehyde. Nembutal is preferably given by mouth for a child one capsule and is of value in selected cases. The author deprecates its use in excess and uses it only as a sedative. Avertin may be used in appropriate doses; however, the writer does not seem to be quite at ease when these drugs are used. Paraldehyde is recommended in children.

Indications for pre-medication.—The strongest indication is the lay pressure. One of these drugs has to be given just to please the patient. But in some who are nervous and terrified at the prospect of an operation it is an excellent thing. In cases of exophthalmic goitre, avertin, gas and oxygen is the best possible combination. Another indication is a recent previous operation specially in children. Atropine before operation is essential if

ether is to be used. Morphia is disliked as it slows the respiration, lengthens the period of induction, and makes more uncertain the signs of complete anaesthesia. In liver cases, cholecystisis, stone in the bile duct or gall bladder, the liver function is low and it is essential to fill these patients with sugar. Sugar is therefore given for a few days. Transfusion in cases of severe anaemia is useful, though its usefulness in septic cases is doubtful.

Post-operative Treatment.—In an uncomplicated abdominal operation the writer gives atropine immediately after the patient is relieved from the theatre in cases suggesting an excess of secretion in any part of the Respiratory System.

The patient is given a rectal injection of Bromide 40 gr. aspirin,20 grains for an adult, for child,5 grains of aspirin,15 grains of bromide. Under this patients are much quieter for 12 hours following operation. Four hours after operation, 12 oz. of 10% glucose for an adult—to the child about 2—8 oz. This procedure tends to cut short post operative vomiting.

For first 24 hours, morphia is given, after this if the patient is sick another glucose injection is given by rectum, if he is well, water or tea for the 1st 24 hours. Next 24 hours jelly or meat extract is given. No purgative is given as a routine for about a week, at any rate it is not given until after 4 days. If there is flatulence on the 2nd or third day, a glycerine enema of 2 oz. of glucose in 4% water is given.

How long you keep a patient in bed after an abdominal operation.—This depends upon the operation, on the individual, on the incision. No rule as to this is possible.

For sleep, morphia is no good for inducing sleep, on the 2nd or 3rd day morphia is useless. Aspirin, medinal or sedolsol. Heroin in old people in small doses repeated several nights after operations soothes them wonderfully.

Posture.—1st 24 hours, Fowler's position is recommended; whatever the operation may have been. After 48 hours, the posture does not materially affect the prognosis of the case. In patients who are weak and after prolonged operation, blood pressure must be taken immediately after operation, and any indication of an embolus formation, must be guarded. The writer gives ceramine two or three times in the immediate post-operative period.

General treatment of a more complicated sort of operation-like suppurative appendix or a case of perforated gastric ulcer, or any case with gross peirtoneal infection :—

Absolute rest to peritoneal and cerebral viscera in general must be enforced. No food or purgative should be given. Even water is withheld for 48 hours. 1% glucose or normal saline per rectum is allowed every 6 hours about 12 oz. at a time. Mouth is kept clean. Morphia given at this stage produces rest to the mind and takes the pain away. Radiant heat to the abdomen or hot fomentation changed frequently will keep up the tone of the intestines. Morphia should not be given when the patient is allowed food by mouth as it is likely to cause distension.

Complications of an abdominal operation.—If on the third or fifth day after operation,patient shows abdominal distension without vomiting or pain paralytic ileus is the 'rule'. But when there is pain and vomiting, think of postoperative intestinal obstruction. It rarely occurs now-a-days, but it is only common in patients who have had purgatives and starvation. Intensive heat and rectal feed must be instituted.

Diaphragmatic Hernias Symptoms and Surgical Treatment in Sixty Cases.—Stuart W. Harrington, Rochester, Minn. (*Journal A. M. A.*, Sept. 23, 1933), stresses the fact that the constant increase in the number of cases of diaphragmatic hernia that are being recognized is due chiefly to the marked advance that has been made in the methods of roentgenologic diagnosis. Most of this increase in the number of cases has been represented by the paraesophageal type of hernia. The symptoms are usually progressive and vary in type and intensity, depending on the amount and type of herniated abdominal viscera and on the stage of the incarceration at which the patient is seen. The symptoms often simulate those of other organic disease of the abdomen and thorax, of which the most common are cholecystitis, peptic ulcer, cardiac disease, secondary anæmia and esophageal obstruction. The symptoms of diaphragmatic hernia are definite, and diagnosis can be made on the symptoms alone but must be confirmed by roentgenologic examination. Operative replacement of the herniated viscera in the abdomen, with repair of the abnormal opening in the diaphragm, is the only treatment that insures complete relief of symptoms, and operative treatment should be carried out as soon as diagnosis is made in cases in which the colon is involved in the hernia, which is usually in the traumatic type. In cases in which the stomach is the only organ involved, and the symptoms are mild, the condition can be treated conservatively, but the patient must be kept under constant observation. If the symptoms

become progressive, operative repair of the opening should be made before serious complications develop, increasing the operative risk. Palliative interruption of the phrenic nerve may be resorted to in selected cases in which reparative operation is contraindicated. Preliminary phrenicotomy is often of value in repair of enlarged hernial openings if there has been considerable loss of structure. The author performed radical operations in fifty-six of the sixty surgical cases. There were five operative deaths and one recurrence. Recent replies received to letters of inquiry from the fifty-five patients who recovered disclose that of the four patients who were subjected to palliative interruption of the phrenic nerve, one has since died of angina pectoris; another, 76 years of age, died of a cause not definitely ascertained but which apparently was a cardiac condition; the other two of the four patients have obtained partial relief of symptoms. Of the fifty-one patients who were subjected to radical operative procedures, all except one have obtained relief of symptoms. One patient had an influenzal type of pneumonia three months following the operation, and because of the severe strain from coughing, the hernia recurred, with associated symptoms. All patients have been examined roentgenologically from six months to one year, or every year, after operation.—*North West Medicine.*

Misleading Gall-stone Symptoms.—A. Catalina brings additional evidence to show the frequency with which the presence of gall-stones may be masked by concurrent gastric symptoms. A multipara of 50 had several attacks of hæmatemesis early in adult life, and since then had suffered from gastrodynia and acid eructations which were usually relieved by a milk diet with bismuth and alkalies. As the symptoms became intolerable and the diagnosis of ulcer appeared a certainty, an exploratory operation was performed. Nothing to account for the symptoms was detected in the stomach or duodenum, but the gall-bladder was found to be enormously distended with a compacted mass of stones which numbered the incredible amount of 3,760. (*Madrid: Archivos Espanola de Enfer-madades del Aparato Digestivo.*)—*Medical World.*

Acute Postoperative Obstruction of the Lower Small Intestine.—Carl B. Schutz, Kansas City, Mo. (*Journal A. M. A.*, May 26, 1934), studied a series of twenty-five cases of acute postoperative obstruction of the lower small intestine in an attempt to discover some

explanation for the failure to diagnose and to treat successfully this type of obstruction. The fact seems evident that improvement in the treatment of low obstruction depends primarily on improvement in its early diagnosis. Low obstruction must be predicated on the assumption that the onset, the progression and the symptoms of low obstruction differ in an important degree from those of high obstruction and therefore, the two types of obstruction must be considered separately. In the separate consideration of low obstruction it seems clear that it is both possible and logical to divide the disease into two stages. Since the first stage seems to be limited to only the mechanics of obstruction and to be accompanied by few evidences of any particular harm to the patient, it seems logical to designate it as the stage of obstruction. It also seems reasonable to designate the second stage as the stage of degeneration, since the gross pathologic changes in the obstructed intestinal loops seem to be of a degenerative nature and to be accompanied by toxic symptoms more or less characteristic of degeneration. The fact that the clinical manifestations of obstruction consistently parallel the pathologic changes in the obstructed loops suggests their close relationship and justifies estimation of the pathologic changes by the clinical observations. Therapeutic endeavour should be directed largely to the stage of obstruction. One of the earliest and perhaps the only specific symptom of the stage of obstruction is uneven distension. Uneven distension occurs soon after the onset of low obstruction; it is present for a short time only and it must be searched for to be found. It is useless to expect uneven distension after the stage of degeneration has begun, for by that time the distension has become and will remain generalized; it is also useless to expect to discover the unevenness of the distension at any time unless all postoperative dressings are removed and a clear, unobstructed survey of the abdomen is made. The symptoms of vomiting and "obstipation with no passage of gas by rectum" are unreliable criteria on which to base the early diagnosis of low obstruction. While vomiting usually occurs at some time during the course of the obstruction, it is often absent in the stage of obstruction and may not even occur in the stage of degeneration. The first essential in the diagnosis of low obstruction is that the possibility of its presence be kept in mind. The high mortality attending low obstruction should dispel any ideas as to its being easy to manage and should stimulate a constant, informed and alert vigilance. The clinical criterion on which the diagnosis of partial obstruction

is based is the passage of gas and fecal matter by rectum. The treatment for low intestinal obstruction is essentially the surgical release of the obstructing lesion. Continuous suction drainage and enterostomy should be considered adjuncts to surgery rather than its substitute. The dictum of early operation has been established by the experience of a great number of competent surgeons, but to this must be added the necessity for constant study and vigilance directed to the early diagnosis of low obstruction. Operation in the stage of obstruction should be followed by a definite decrease in the mortality of low intestinal obstruction.—*Medical Times.*

Correspondence

LEAGUE OF NATIONS' SECOND INTERNATIONAL CONFERENCE ON THE STANDARDISATION OF VITAMINS

THE second international conference on the standardisation of Vitamins convened by, and held under the auspices of the Health Organization of the League of Nations was held in London from June 12th and 14th under the chairmanship of Dr. E. Mellanby, Secretary of the Medical Research Council of Great Britain.

The report of the conference recommended provisions for two years for international adoption, standards and units for four Vitamins A, B, C, and D, concerned with growth and infection with beri-beri, scurvy, and prevention of rickets respectively. Since certain of the standard preparations recommended for adoption were not available for general use until 1932, the present conference had at its disposal the results of two years experience with the provisional standards.

As in the 1931 report, standards and units are recommended only for 4 vitamins, the possibility of adopting standards for vitamins B_2 and E was considered at the present conference. Many hold that insufficiency of Vitamin B_2 causes Pellegra and that Vitamin E is necessary for successful reproduction in both male and female. The Conference felt that our present knowledge of these vitamins, and of the pathological results to which their absence gives rise, is still insufficient to justify the adoption of standards and units.

The standards for Vitamins A and C, provisionally adopted in 1931, have been altered. The substitution of more clearly defined

and more easily reproductible chemical substances is a useful step in advance. As Vitamin A, pure carotene has been chosen in the place of the standard preparation of carotene recommended by the previous Conference. The Vitamin C standard chosen is ascorbic acid, a substance which the work of Szent-Guorgy (Hungary) showed to be identical with Vitamin C. No change has been recommended in the case of the Vitamin B_1 and D standards. The former has proved highly inconvenient in practice—of all the standards chosen by the 1931 Conference the Vitamin B_1 standard has perhaps served most satisfactory—and a large stock sufficient to last for many years, is available at the central institution from which the standards are distributed—the National Institute for Medical Research, London. The Vitamin D standard remains unaltered. With the provisco that it may be replaced when exhausted (or should it become for any reason unsatisfactory) by crystalline Vitamin D in suitable solution. Large quantities of the standard solution of irradiated ergosterol are available.

The units remain the same in all cases. Where a change has been made in the standard material, the old units have been restated in terms of the newly-adopted substance. The desirability of leaving the original units unaltered is emphasised by the fact that certain of the units recommended by the 1931 Conference have been adopted into the pharmacopoeias of a number of countries.

Vitamin standards and units are today of considerable importance, not only in connection with scientific work but in the commercial field. In all civilised countries one observes the production of Vitamin preparations on a large scale, and it is obviously to the advantage of both manufacturer and purchaser to have some method by which the potency of such preparations may be described. Further, the existence of standards and units facilitates control of such preparations by public health authorities who wish to protect the consumer from wasting his money on preparations which are alleged to be rich in Vitamins but which may in fact be quite otherwise.

COURSES OF TRAINING HELD BY THE BERLINER AKADEMIE FOR MEDICAL RESEARCH

Extension Course from 1st Oct. till 2nd Nov. 1934

In order to train enough workers for the national campaign of Health and Hygiene, arrangements are being made with all energy to promote the continuation of the studies of the young German physicians in every respect. The Berlin Academy for medical extension courses is arranging for a number of important and interesting courses of lectures within the scope of the Academy study programme in October,—from 1st to 13th October internal medicine, taking tuberculosis specially into consideration. Further, another special Tuberculosis Course of Lectures will take place in the "Waldhaus Charlottenburg" from 15th to 20th October. An extension course week is also fixed for 15th to 20th October, dealing with obstetric-gynaecological branches of medicine. Beyond this lectures on rhinology, otiatrics and the therapeutics of the throat will be delivered from 1st to 13th October, from 22nd to 27th October, and from 29th October till 2nd November in regard to the surgery of intrathoracic diseases. At the same time individual courses of lectures will be given in regard to all spheres of medicine with practical work in hospitals and in the laboratory. In connection with these courses special importance will be paid to practical work.

In response to repeated requests from abroad the "Berliner Akademie fur arztliche Fortbildung" has resolved to permit doctors of foreign nationalities also to take part in these courses of lectures. In this connection attention may be drawn to the reduction of 60% in all passage prices, both on land or water, for all persons who have their domicile without the boundaries of Germany and provided that they stay in Germany at least seven days and at the longest two months. This reduction in fares is granted for the journey resp. voyage to and fro and also for all cross or zigzag trips in its connection. The passage tickets at these reduced prices are not sold in Germany but only at the foreign Agencies of the central European Travel Bureau on presentation of the travelling passport, showing that the residence of the traveller in question is situated abroad.

It may be hoped that this specially favourable opportunity for an extension of studies in the most important special spheres of medicine will be utilized very extensively. All further details

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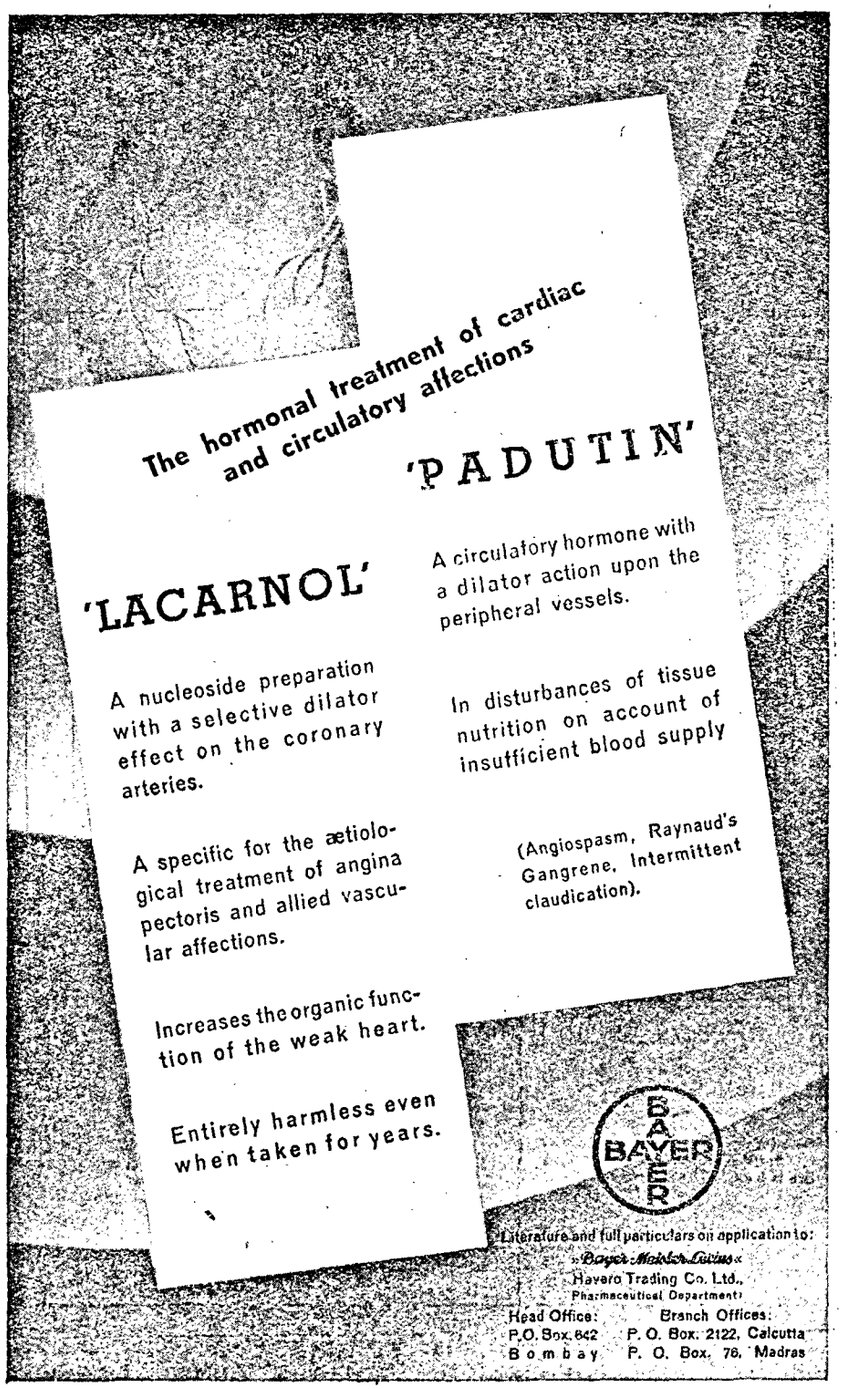

will be supplied on application to the Office of the Berliner Akademie fur arztliche Fortbildung, 7, Robert Koch-Platz (Kaiserin Friedrich-Haus), Berlin, Nw. 7.

Book Reviews

The Art of Surgery:—A Text Book for Students and Practitioners—*By H. S. Souttar*, D.M., M.CH., (OXON.), F.R.C.S., (ENG.), 1933, 2nd edition, pp. 631, London: William Heinemann (Medical Books), Ltd. Price *sh.* 30/-

This book is in its second edition, the first having appeared in 1929. The author who is very popular, needs no introduction to our readers. The object of the book would seem to be to present to the student that which is essential omitting all non-essentials and lightening his burden. This, the writer has achieved so admirably, being a teacher himself with the gift of describing conditions so lucidly and in an impressive manner without leaving important points. This edition has been thoroughly revised so as to give room for the most valuable recent methods and the latest advance in the art has been incorporated.

The book is copiously illustrated and an important feature of the book is the sketches in the margin of the page opposite to the subject matter, which help greatly to illuminate the points stressed. Having come from such an able surgeon and an experienced teacher, the book is bound to be very popular, and we recommend it to all the medical students as a very reliable and up-to-date book and to the medical practitioners, a good addition to their library.

A Study of Nephritis and Allied Lesions—*By John Gray*, 1933, 141 pages. A Medical Research Council Publication. [H. M's Stationary Office, London.]

In this report Dr. John Gray has approached the subject from a clinical and a pathological standpoint, and has endeavoured to supply a classification that will satisfy both. Working at the Aberdeen Royal Infirmary and the Royal Aberdeen Hospital for sick children, he has examined the kidneys of over 500 cases and has analysed the histological and clinical findings in all those in which a nephritis or allied type of lesion was evident. The first cases discussed are those of acute nephritis. Various attempts at

subdivisions such as glomerular, tubular, parenchymatous, haemorrhagic, etc., have been rejected, because they fail to indicate any fundamental difference of aetiology, histology or clinical aspect. The term subacute nephritis has been adopted. This is considered to be a later development of the first group. Somewhat later stages of the same condition found in cases beginning to show sclerotic features, but still displaying active epithelial crescents have been designated early chronic nephritis. The next group considered is that of chronic nephritis, and includes sclerotic nephritic kidneys. The term 'Nephrosis' has been reserved for the purely degenerative renal condition. The next group discussed is the large group of nephritic conditions, or more strictly, of conditions allied to nephritis—those due to vascular changes. All these changes and classifications are thoroughly discussed and illustrated with cases. Since there is no final decision as to the best method of classifying nephritis and allied lesions a perusal of this book will certainly help in the elucidation of this difficult problem.

An Introduction to Practical Bacteriology—*By T. J. Mackie*, M.D., D.P.H. and *J. E. McCartney*, M.D., D.Sc., 4th edition, pp. 504+viii, 1934. [E & S. Livingstone, Edinburgh.] Price *sh.* 12/6 Net.

This book has been completely revised. It is divided into three parts. Part I is of an introductory nature and deals briefly and in a general way with the biology of micro-organisms and with immunity in relation to practical bacteriology. Part II is confined to bacteriological and serological technique. Part III contains an account of the individual organisms, including the filterable viruses, and their diagnosis by bacteriological means. The book has been well written and will be very useful to the student as a ready reference work and to the specialist also as the technique of bacteriology is dealt with very fully in its pages.

Physiology of the Central Nervous System and Special Senses—*By N. T. Vazifdar*, L.M.S., F.C.P.S., A.I.R.O., 1934, 6th edition, 39, illustrations, Ideal Books Co., Medical Books Publishers, Bombay 8.

The 6th edition of this very popular book has been thoroughly revised and re-arranged. The author with his experience has rendered the study of the Nervous system very easy and interesting. After a few introductory pages dealing with the histology and

minute anatomy of the nervous system, the spinal tracts have been described in an illuminating manner, and each section is summarised with the help of a tabular column which arrangement will not fail to impress the student what has been read in the previous pages. The various tracts in the medulla, pons-cerebellum and cortex have been similarly dealt with, with diagrams, to illustrate the points. The chapter on Reflexes and the effect of sections of cord is instructive. The section on special senses is good. We have no hesitation in saying that this book would continue to be popular among students and all those interested in the study of the Nervous System.

Abscess of the Brain—Its Pathology, Diagnosis and Treatment—*By E. Miles Atkinson*, M.B., B.S., F.R.C.S., 1934, Illustrated, pp. 276. [Medical Publications Ltd., Strand, London]. Price *sh.* 21/–net.

This book embodies the Jacksonian Prize essay for 1926, re-written, enlarged and brought up-to-date. Subsequent cases and subsequent experience have been incorporated.

The author gives a fairly comprehensive outline of the pathological and clinical aspects of this condition. In doing this, in addition to his own experience, he draws extensively upon the published works of other investigators. This book will appeal not only to the specialist, who will find accounts of cases, statistics, and a liberal bibliography set apart in appendices for special study, but also to the general practitioner and senior student who will find in it, information of interest and value presented in a readable form. The book is profusely illustrated and the get up is very satisfactory.

Senile Cataract, Methods of Operating—*By W. A. Fisher*, M.D., F.A.C.S., wth the collaboration of Prof. E. Fachus, Vienna; Prof. I. Barraquer, Barcelona; Dr. John Westly Wright, Columbus O.; Dr. A. Van Lint, Brussels; Dr. O. B. Nugent, Chicago. IInd edition, pp. 267, 183 Illustrations, 112 of which are coloured; Published by: Chicago Eye, Ear, Nose and Throat College, Chicago, Ill. U. S. A.

This book is devoted to a consideration of the methods of operating on Senile Cataract. The book is contributed by famous men of the world, and every chapter deals with the methods adopted by its contributors.

The first edition appeared nearly eleven years ago and several

changes in the technique have been suggested. It has now been revised so as to include all the newer methods. Prof. E. Fachus's chapter has been reproduced as such, while Dr. Barraquer's chapter remains practically unchanged.

All the other chapters have been revised and rewritten. You will find in this book a collection of methods of intra capsular extraction of senile cataract as practised by its exponent, each claiming good result in his own hands and similarly extra capsular method. We heartily commend the book to our readers.

Notes on Clinical Laboratory Methods—*Issued by the Standing Committee on Laboratory Methods, University of Glasgow*, 1933. IInd edition, pp. 79, John Smith & Son, (Glasgow), Ltd. Price *sh.* 2/-

The methods set forth in this book for use in the teaching of clinical medicine in hospital wards have been approved by the Standing Committee instituted by the Faculty of Medicine of the University of Glasgow. The book contains chapters on Urine, Blood, Gastric contents, Faeces, Pus, Urethral Secretions, Exudate from Chancre, Sputum, Secretions from Throat, Nose, and Naso-pharynx, Pleural and Peritoneal Fluids, Skin, Hair, Nails, Cerebro-Spinal Fluid, Tissues for histological examination, etc.

A few blank pages have been left at the end of the book presumably to enable the student to note down additional information. We are sure students of medicine will find this book very useful.

The Relief of pain in Child-birth—*By F. Neon Reynolds*, M.I.O.G., F.R.C.S., (EDIN.), 1934, pp. 114, Medical Publications, Ltd., London. Price 10 *sh.* 6 *d.*

The question of relief from pain in childbirth is one which has been receiving considerable attention of late. An enormous amount of literature has appeared in the medical press and the busy practitioner will find it difficult to keep himself abreast of the times. The author has therefore done a great service by collecting in this little book materials from all the recent works on anaesthesia in childbirth.

A short introductory and historical note is first given. The author then deals with the physical and minor mental discomforts associated with pregnancy. The properties required in the drugs in the stages of labour are then discussed. Then the advantages

and disadvantages of all the new anaesthetics are discussed in more, or less detail and in relation to the stages of labour. A chapter is devoted to the management of those cases attended by midwives only. After considering all these the author concludes that the following are the safest, most useful and most effective:

(1) In the first stage of labour,

  (*a*) for primi gravidae morphia and scopolamine followed by paraldehyde (per rectum);

  (*b*) for multi-gravidae, paraldehyde, preceded by morphia and scopolamine only in selected cases.

(2) In the second stage of labour,

  (*a*) chloroform given through a junker's inhaler;

  (*b*) gas and oxygen if a skilled anaesthetist is present.

In conclusion, this small volume provides a concise but sufficiently detailed account of modern methods. We heartily recommend it to all general and midwifery practitioners.

A Handbook on Diabetes Mellitus and its Modern Treatment—*By J. P. Bose*, M.B., (CAL.), F.C.S., (LOND.). In charge Diabetes Research, Calcutta School of Tropical Medicine and Physician in charge of Diabetes Department, Carmicheal Hospital for Tropical Diseases, Calcutta, 1934, IInd edition, 232 pages. [Thacker, Spink & Co., (1933), Ltd.]. Price Rs. 6/8/-

The present edition is a great improvement on the first edition. Each chapter has been completely revised and most of the important findings about the disease have been incorporated in the book. Some of the chapters, particularly those dealing with the carbohydrate metabolism, the pathology and treatment of diabetes, recent views on the treatment of acidosis and coma have been re-written. Among the new additions, the more important is that dealing with diabetes in children. A chart giving the average weight of Indians according to age and height, a few useful recipes for diabetic patients, and a table giving the approximate amount in grammes of carbohydrate, proteins and fat and calories yielded by one ounce of common food stuffs, a simplified method for estimation of blood sugar are some of the very useful features of the book. We certainly agree with Major-General Megaw when he says in the foreword that as Dr. Bose has been engaged for several years on research work dealing with the Indian

aspects of Diabetes, his book will make a special appeal to the medical men of India.

The general get up of the book is very good and it is not very costly. We are sure it will be as successful as its predecessor. We congratulate the author on the thoroughness with which he has treated the subject.

The 1933 Year Book of Obstetrics and Gynaecology—*By Joseph B. DeLee*, M.D., and **Section on Gynaecology**—*by J. P. Greenhill*, M.D., F.A.C.S., Second edition, pp. 630, Chicago: The Year Book Publishers.

This book is one of the ten volumes of Practical Medicine year books which are now in their thirty third year. It contains a gist of all the latest contributions on the subject during the past year in the various Journals of the world. The first part on Obstetrics contains contribution on Pregnancy, Labour, Puerperium and the New-born. Reference to each article is given as a foot note and at the end of each contribution are printed in smaller types the criticisms of the editors.

The section on Gynaecology treats on general principles, diagnosis, sterility, ectopicgestation, operative technique and anæsthesia, menstruation and its disorders, infections, glands of internal secretion, benign tumours, malignant tumours and electrotherapy and radiology. This would prove an useful addition to every medical man's reference library.

Puerperal Infection—*By James Robert Goodall*, B.A., M.D., C.M., D.Sc., O.B.E., 1932 ; pp. 189, Murray Printing Co., Ltd., Toronto, Canada.

This book is the embodiment of twenty eight years of clinical experiences and enquiries of the author and as such contains good deal of information on puerperal infection for the student, practitioner and specialists. The book is made up of XVI Chapters. After devoting a few pages on historical notes on puerperal infection, the causative agents of the condition are given. The chapter on frequency of puerperal infections deals with standard morbidity and mortality. Sources of puerperal infections are considered in Chapter IV. Chapters V, VI and VII describe the immunity and predisposition, pathology of puerperal infections and pathology. After devoting a few chapters on the clinical aspects of puerperal

infections and symptoms, and differential diagnosis, treatment is discussed under the following broad heads viz., Preventive, General, Surgical and Special.

Breast infections during lactation form the subject matter of the last chapter. A good bibliography is given at the end of the book. The book is lucidly written, and students and practitioners will find it instructive.

Year Book of Radiology (1933)—*By Charles A. Waters Ira I. Kaplan*, The Year Book Publishers, Inc. Chicago.

This is the second volume of the series, the first having appeared in 1932. The object of this volume is to give the reader an idea of the latest developments in the art during the past year, so as to facilitate easy reference, while for those who do not have access to a consulting library, it is a source of ready reference.

There has not been much of progress in Radiology although refinements in technique and additional criteria in endocrine and blood dyscrasias, notably, planigraphic of Ziedses des Plantes, exposure at higher milliamperage, bone changes in parathyroid hormones and changes in the gastric mucosa in pernicious anaemia have been introduced. The book contains two parts, the first part gives Radiological Diagnosis and the second part treats with Radiotherapeutics.

The book is copiously illustrated. We are sure medical practitioners and those working in this speciality will find it helpful.

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Notice

XI ALL-INDIA MEDICAL CONFERENCE, 1934

The XI All-India Medical Conference will be held in Delhi during the ensuing Christmas week. Subjects concerning the vital interest to the Medical profession in India, *e.g.*, Rural Medical Relief, Health Insurance Scheme, Indian Medical council Act. etc., will be discussed in the Conference. The Scientific Section of the Conference and the exhibition will no doubt be of special interest to all medical men and women. In order to make this Conference thoroughly representative of the medical profession of India it is requested that all members of the profession should join the Conference and take part in the deliberations. For particulars, please write to the Organising Secretary, XI All-India Medical Conference, D. M. A. House, Darya Ganj, Delhi.

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DR. U. RAMA RAU & U. KRISHNA RAU. M.B., B.S.

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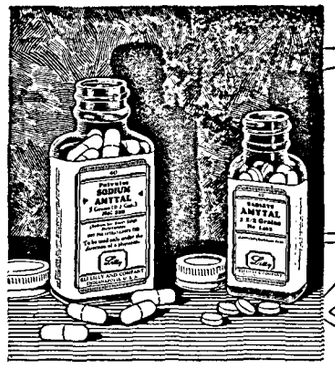

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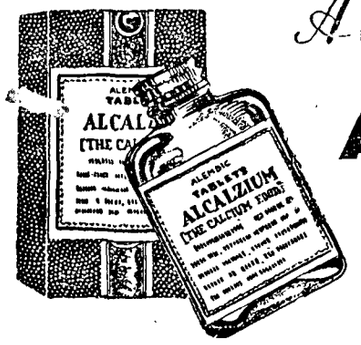

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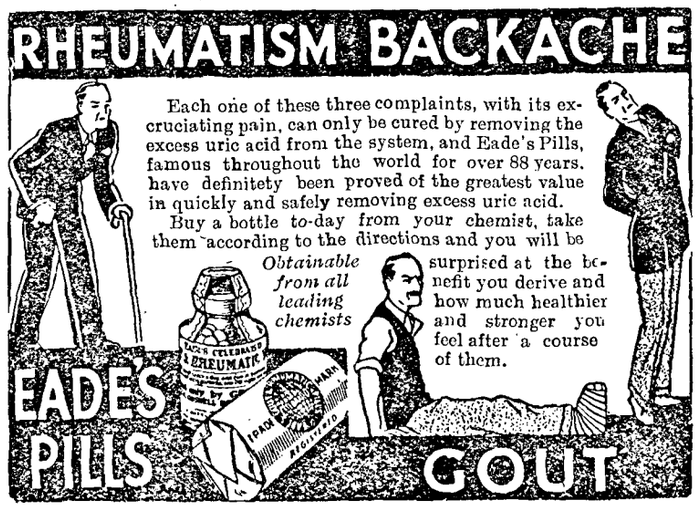

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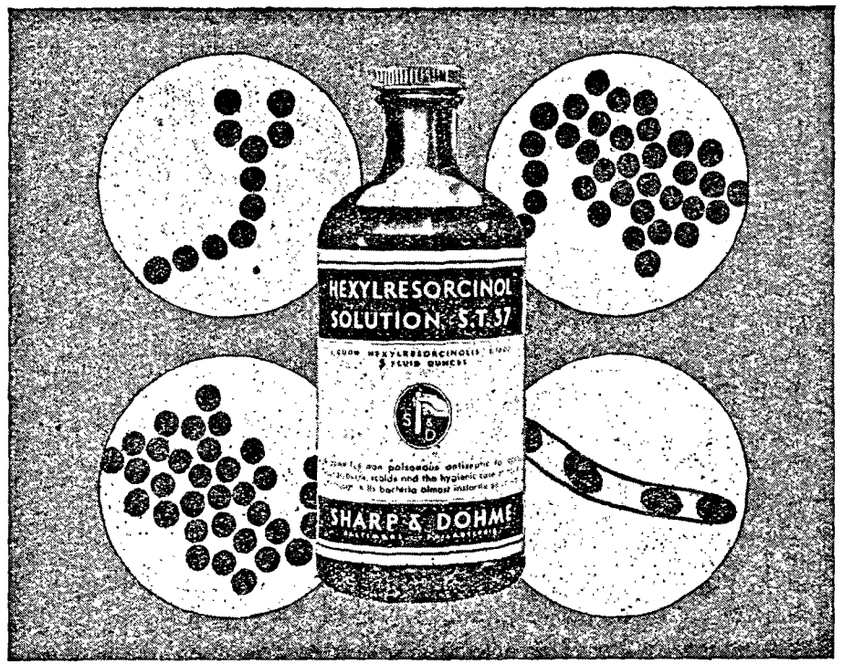

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ANAEMIAS OF INFANCY AND EARLY CHILDHOOD

BY

DR. P. L. DESHMUKH, M.D.,

Poona.

THE object of this paper is to present the different varieties of Anaemia of infancy and early childhood in such a form that it may be readily available to the busy practitioner. No attempt is made to give exhaustive descriptions of the different clinical entities as they may be found in any common book on diseases of Children. But an effort is made to bring out the salient diagnostic points in them. For the intelligent understanding of the pathological reactions of blood in the different anæmias, a short description of its mode of formation and the physiological picture in early life will not be out of place.

Formation of blood

In the well developed foetus red blood cells are formed not only in the red marrow of all the bones but also in definite islands of erythrogenic tissue found in the spleen, liver and lymph tissue of the body. The embryonic sites of red cell formation continue to function as such for a few months after birth when the bone marrow assumes the entire burden of red cell formation. In the young child the marrow is red throughout the length of the long bones and as the adult age is reached the function is confined only to the heads of long bones, the small spongy bones and the flat bones of the body. Hence we see that in the child there is no

yellow marrow as in the adult to act as a potential hemopoietic tissue to offer help in times of greater demand for coloured corpuscles. Thus, the red cell destruction is badly compensated in a child and its effects become easily obvious.

There are three important types of white blood cells and each type has its different site of origin. The granular cells or leucocytes are formed in the red marrow of bones. The lymphocytes are mainly produced in the spleen and other lymph nodes of the body. The hyaline or Endothelial cells have their origin in the reticular endothelium lining the blood sinuses of liver, spleen, lymph nodes and bone marrow.

The platelets owe their origin to a specialised type of marrow cell called the Megakaryocyte or the Giant Cell.

Physiological blood picture

At birth, the total number of red blood cells is about five or six millions. After about six months, it falls to four and a half millions, then gradually rising to the adult number as age advances. The total number of white blood cells is about 15,000 to 20,000 at birth, which gradually falls down to between 5,000 to 10,000 in adult age. The Haemoglobin percentage varies as the number of red blood cells, but the fall in Haemoglobin percentage is even more marked and continues even after the fall in % of R. B. C. has ceased. At six months, the haemoglobin percentage is about 70% which remains steady throughout infancy till the second year. After that a gradual rise in the haemoglobin is noticed till the normal figure is reached at puberty.

Differential counts in the new-born on the first day are obtained by Carstangen. The Leucocytosis of the newborn is of the polymorphonuclear variety. The number of polymorphs falls by the end of the first week. After that Lymphocytosis is noticed until about the 5th to 8th year. After 8th year the blood picture tends to assume normal appearance.

Normoblasts, Megaloblasts, increased number of reticulocytes and immature Leucocytes are common in blood smears at birth. These cells tend to disappear during the first few weeks of life.

Another characteristic of blood picture in infancy is its instability. The Circulation becomes flooded with immature cells with great ease and with least provocation. Thus, the "threshold" for the appearance of immature blood cells may be said to be low in infancy.

For the sake of description it will be convenient to divide the Anaemias clinically into the following three groups:—

(1) Anaemias whose cause is known or can be easily found out from clinical history.

(2) Anaemias whose cause is still unknown but who are associated with some definite physical signs, blood picture or clinical syndrome.

(3) Anaemias whose etiologic factor is still unknown and whose only constant feature is progressive Anaemia.

Among the first group, I include the following conditions:—

(1) Anaemia due to Haemorrhage.
(2) ,, Nutritional Disturbances.
(3) ,, Infective conditions.
(4) Anaemia of Congenital origin.
(5) Anaemia due to Neoplasms.
(6) ,, Chemical poisons.
(7) ,, Parasites.

1. **Haemorrhage.**—The loss of blood may be either sudden and of large amount at a time or slow and of smaller amounts over a protracted length of time. There may be a history of an injury with profound bleeding to account for an acute loss of blood. Chronic bleeding like that from gums or nose may account for some cases. I have found frequent bleeding per urethra in young children resulting from a vesical calculus as the cause of Anaemia. The blood in urine may not be apparent to the naked eye and can only be found out by the microscope or chemical tests. One should always remember Haemorrhagic Diseases in connection with infantile Anaemias. The complaint of the Hemophilic is easy bleeding with slightest cause. Purpuric bleeding is idiopathic and may take the form of recurrent nose or gum bleeding. Recurrent petechial haemorrhages under the skin may be a potent cause of Anaemia. Henoch's Purpura should be thought of when there is history of severe colic usually accompanied by bleeding per rectum and petechial haemorrhages under the skin or an articarial rash. Lucas and Washburn describe an interesting case of Duodenal Ulcer in a child aged 8 months. "The child was admitted for increasing weakness and pallor for three months. During this period the mother noted that the baby seemed listless, did not take her

feeding well and vomited quite large amount of curds several hours after feeding. The baby seemed to resent abdominal palpation. Occult blood was found in the stools on several occasions. Radiogram showed an ulcer in the Duodenum."

This emphasizes the examination of urine and faeces for occult blood in anaemic children.

Signs, Symptoms and Course.—Anaemia is the most remarkable sign. In acute loss of blood pallor, air-hunger, dizziness and coldness of limbs are prominent symptoms in proportion to the amount of blood loss. In chronic loss of blood, the usual symptoms of Anaemia *viz.*, pallor, weakness, loss of appetite, listlessness etc., in addition to the symptoms caused by the etiological factor responsible for the chronic bleeding are present. The child is easily tired. A bruit de Diable is often audible over large vessels in the neck. Haemic bruit are less frequent in children.

Blood.—On pricking the finger; it will be found that the blood is more fluid and its coagulability is diminished. Examination of smear will show poikilocytosis, anisocytosis and presence of nucleated red blood cells indicating their rapid regenerations. Additional evidence of regeneration may be obtained by Vital Staining of the smear for Reticulocytes which may be found to have increased up to 10 to 15 per cent. A mild post-haemorrhagic leucocytosis is observed.

Treatment.—The cause of loss of blood must be found out and treated. In acute loss of blood, one or more transfusions are of immediate use. The usual hematinics like iron and arsenic, and nourishing diet should follow in both types after the loss of blood is controlled.

Iron should be given in the form of Syrup Ferri Phosphatis, Ferricarb., or one of its scaly preparations. When given with malt the taste is pleasant and malt counteracts the constipating effect of iron to some extent. The stronger preparations of iron like Perchloride of iron and the Sulphate may be given in severe cases preferably with some laxative. I prefer the recent preparations Ferradol (P. D. & Co.) and Colliron (Evans Lab.) as iron can thus be administered in an active and convenient form. Arsenic is best given in the form of Liq. Arsenicalis; but in prescribing Arsenic a definite limit for the duration of administration should be put down to avoid gastroenteritis.

Heliotherapy is said to be of decided value. Ultra-violet rays are also useful.

2. **Nutritional Anaemia.**—Disturbance of nutrition may be due to deficient nutritive value of food stuffs or due to their deficient absorption and assimilation as a result of gastro-intestinal derangement and want of sufficient sun light. Nutritive value of foods depends on its nitrogen content, minerals and vitamine content. In children the common deficiency is of the latter two. The anaemia of babies fed on mother's milk for a prolonged time is due to deficiency of Iron in the milk. In babies fed on boiled milk alone anaemia is due to deficiency of vitamins which may take the form of Rickets and Scurvy. Absorption may be impaired as a result of gastro-intestinal catarrh resulting in chronic diarrhoea or vomiting. Anaemia due to deficiency of sun-light and of vitamines A and D is usually associated with rickets. Anaemia resulting from Caeliac Disease also belongs to this type.

Diagnosis and Treatment.—Diagnosis may be arrived at by close inquiry about the history and diet of the patient. Treatment consists in the proper adjustment of diet. In giving milk to babies care should be taken not to boil the milk, to dilute in proper proportion with water to avoid excess of fat and to strain it when no fat is to be administered. A few drops of Ostelin, Adexolin or Haliverol and lemon juice make up for the deficiency of vitamines. Iron in the forms mentioned above may be administered. But it is recently known that Copper in combination with Iron helps better. The Copper probably acts as a catalyst as only small amounts are required to enhance the work of Iron in heamoglobin synthesis. Cases cured only on Iron may be due to the presence of minute amounts of copper in the Iron as impurity. Yolk of egg may be added to the dietary of elderly children. Where milk does not agree and causes flatulence, albumin water and Glucose D (Glaxo Lab.) may be substituted.

3. **Anaemias due to infective conditions.**—I have found chronic Bronchopneumonia and Otitis Media as the commonest causes of anaemia due to infective conditions in children though Tuberculosis and Congenital Syphilis are also potent ones. Enlargement of lymphatic glands at the hilum as found out by Radiogram may be the only sign of Tuberculosis and should raise its suspicion in a child. Nephrosis with puffy face and oedema on feet and occasionally ascitis is discovered as the cause of anaemia in neglected babies. Enlarged, cryptic tonsils and adenoids should be looked for. Hutchinson in his "Lectures" refers to Acute Rheumatism and Diphtheria as the prominent causes of anaemia, among acute

infective fevers. Osteomyelitis and other suppurative conditions should be thought of.

Treatment.—Treatment is directed against the particular infective condition responsible for the anaemia. In addition to the specific treatment palliative treatment with iron and nutritious diet should be given side by side.

4. **Anaemia of congenital Origin.**—A normal child is born with a good store of iron in the liver (Bergh). When the child is premature, a twin or when during intra-uterine life it had no chance to store iron because the mother did not assimilate a sufficient amount of the element, the child is born with a deficient store of iron. The amount of iron obtained by the child from the mother's milk is only a small fraction of its requirement and hence the child has mainly to depend on its hepatic store of iron. If in addition to the deficiency of iron store, there is some blood destroying factor working to produce anaemia, the latter becomes more profound for want of blood regeneration due to primary deficiency of iron.

Diagnosis is to be made from Syphilis. This condition being mainly an iron deficiency reacts marvellously to the treatment with iron. The following case will illustrate the statement.

A Child B. S. K. aged about 3 years was very anaemic and unable even to sit up. Its weight was only 14 lbs. From history it was known that the child was born prematurely at 7 months of pregnancy. After excluding other causes, Congenital Anaemia was diagnosed. The child was put on Ferri et amm. citras gr. 10 per day. Ferradol and later Colliron were prescribed. In two months time the weight increased to 20 lbs. and the hue of the skin changed from pale yellow to brownish. The child was unable to sit up even for an hour at a time; and now after six months is able to walk.

5. **Anaemia due to Neoplasms.**—Benign Tumours seldom produce anaemia. The existence of a malignant neoplasm somewhere in the body is usually attended by a marked Secondary Anaemia. The severity of the Anaemia is proportionate to the degree of malignancy of the new growth. The malignant tumours commonly met with in children are the Sarcomata and those arising from Embryonic Rests. Medical treatment is only palliative.

6. **Anaemia due to Chemical Poisons.**—

(1) *Lead.*—Poisoning with lead occurs in those babies who are in the habit of gnawing and chewing painted objects. It may also occur by giving lead lotion to the child by mistake in place of mixture. In the chronic form the symptoms are of Secondary Anaemia, colic, obstinate constipation, convulsions and severe headache. Blood smear shows Basophilic stipling of the red blood cells.

(2) *Mercury.*—Though children tolerate mercury well its prolonged administration may cause anaemia. Gingivitis and salivation are rarely marked in babies. The important signs of intolerance is loss of weight and anaemia. When these appear the drug must be withdrawn.

(3) *Potassium Chlorate.*—This drug in toxic doses causes anaemia by distruction of red blood corpuscles.

7. **Anaemia due to Parasites.**— The commonest cause of Secondary Anaemia in children is infection by Round Worms. The diagnosis is made clinically by earthy pallor, ravenous appetite, rubbing of the nose and pulling at the prepuce. Examination of stool will finally decide.

Among diseases due to parasites in the blood, Malaria stands foremost. The child has usually an enlarged spleen but that alone rarely helps to distinguish Malaria since splenic enlargement is a common accompaniment in infantile anaemias. Hence blood examination is necessary in every case of splenic enlargement in a child. Kala Azar is not common on the Western side and Sleeping Sickness is yet unknown in India.

Following conditions can be included in Group ii :—

(1) Von Jaksch's Anaemia.
(2) Bânti's Disease.
(3) Gaucher's Disease,
(4) Leucaemia
(5) Hodgkin's Disease.
(6) Lederer's Anaemia.
(7) Nieman's Disease.
(8) Hemolytic Jaundice
(9) Biliary Cirrhosis of Liver.

1. **Von Jaksch's Anaemia.** —(Splenic Anaemia or Anaemia Pseudoleucaemia Infantum).

It is doubtful whether this is a clinical entity or only a symptom-complex. The present tendency is towards regarding this condition more as a clinical syndrome than as a disease *sui generis*.

In 1887, Von Jaksch originally described a series of unusual anaemias in infants and young children. At present what goes by his name is not exactly what he described in 1887. Many cases of unexplained anaemias in infancy with enlargement of spleen have been classified as Von Jaksch's Anaemia only to discover later a cause which can account for the anaemia. Believing the condition to be a secondary one the authorities are not unanimous about its causal factor. It has been ascribed to Rickets and Congenital Syphilis. Though one or both are occasional accompaniments of Von Jaksch's Anaemia, there is no evidence to regard the latter as secondary to them. Both may be due to a common cause. Thus, obscure in its causation and confused in its definition the disease consists of the following symptoms :—

(1) Marked reduction of red blood Corpuscles and Haemoglobin.

(2) Enlargement of spleen.

(3) A moderate leucocytosis rarely exceeding 30,000 W. B. C. per C.mm. The peculiar feature of the blood film is the constant presence of immature white blood Corpuscles-Myeloid or Lymphoid. In this feature it resembles Leucaemia so much so that it has secured for it the synonym—Pseudoleucaemia Infantum.But its course is very much unlike that of Leucaemia. The condition is confined to the first three years of life. Boys are more often affected than girls. Emaciation is seldom marked and fever is occasionally present.

The duration is 6-9 months. The course is slow and tends to recovery in 70%. In fatal cases death is due to exhaustion or intercurrent diarrhœa.

Treatment.—In addition to abundant fresh air, light and nutritious food, iron is said to help in these cases. Mercurial treatment in the form of Grey Powder by mouth or ointment by inunction is found to be of use because it is difficult to exclude the influence of Syphilis It may also be useful because of its antiseptic effect on the intestinal canal. Liq. Arsenicalis may be prescribed.

2. **Banti's Disease.**—This condition is not found in infancy and rarely in later childhood usually after the 10th year. Its etiological factor is still in darkness. Authorities differ on the point whether it can be considered as a disease by itself or only as a

symptom-complex like Von Jacksch's Anaemia. Following are the main features of the Syndrome.

(1) Enlargement of spleen.

(2) Leucopenia with progressive secondary anaemia.

(3) Enlargement of liver followed by cirrhosis and diminution in its size at a later stage.

(4) Jaundice, ascitis, hematemesis and hepatic toxaemia appear towards the end.

The disease is chronic in its course usually ending fatally within 2-3 years. The cause of death is hematemesis, toxaemia, progressive weakness or secondary infection.

Treatment.—Only splenectomy is believed to be able to save the patient. Hence it should be advised as soon as the diagnosis is made. The anaemia should be treated by repeated Transfusions and iron. X-Ray exposures are said to diminish the size of the spleen but the progress of the anaemia and the disease remain unaffected.

3. **Gaucher's Disease.**—The condition was first described by Gaucher in 1882. It is a rare condition and difficult to diagnose clinically during life of the patient. Though its main incidence is in childhood, cases have been recorded in patients from 2 months 44 years of age. Its chief characteristics are as follows.—

(1) Its familial incidence.

(2) Huge enlargement of spleen and later also of liver.

(3) Secondary Anaemia and Leucopenia.

Diagnosis during life can only be made with certainty by the examination of sections of spleen removed surgically or at the Post Mortem Room. The splenic tissue is greatly infiltrated by mononuclear cells of the endothelial type. These cells known as Gaucher Cells are large, pale and granular with vacuolated protoplasm. They have been described as filled with some peculiar lipoid material-perhaps a product of abnormal metabolism of fat. Infiltration is not limited to spleen alone. Liver, lymph glands, bone marrow, adrenals are also found to be similarly affected.

Treatment.—The present conception that it is a generalized disease brings in question the value of splenectomy. Though cases are known to improve after splenectomy it should be considered only as a palliative measure. Splenectomy should be advised as early as possible when the diagnosis rests between Banti's disease, Gaucher's, Neiman's or such other disease where splenectomy is

indicated. The operation is justified since prognosis is worse without any treatment.

4. **Leucaemia.**—Lymphatic Leucaemia is the common type found in children. It is usually acute in its course in childhood. There may be an insidious onset with a history of malaise, weakness, growing pallor. In fulminating type high irregular fever with petechial subcutaneous haemorrhagic spots may be observed. Progressive enlargement of spleen and lymph nodes may be found. Progressive pallor, lack of energy and occasional nose bleeding are early symptoms in the insidious type. Gradually the child becomes apathetic, breathless and ultimately dies.

Diagnosis.—Diagnosis is clinched by examination of blood which shows a marked increase of W. B. C., which may be from 1,000,000 to 4,000,000 cells per cubic mm. with predominence of lymphocytes or myelocytes in various stages of development to the extent of even 99%. Syphilis and Tuberculosis should be excluded.

The acute type usually ends fatally within two to eight weeks. The course of the chronic form is for about eight months.

Treatment.—Though splenectomy has been advised for Leucaemia, in children among whom usually the acute type prevails the results are not encouraging. In addition the post operative complications like those of thrombosis and embolism make the operation unsuccessful. Arsenic has been tried with some success. Benzol is a double edged weapon in that it is a protoplasmic poison. It destroys the leucocytes and marrow tissue but as well injures the erythropoietic tissue. X-Ray Radiations have been used with a degree of success in reducing the size of the spleen.

5. **Hodgkin's Disease.**—The disease is almost unknown in infancy and seen only occasionally in childhood usually appearing between 5 to 10 years of life. A progressive anaemia, enlargement of lymph nodes and hyperplasis of lymphadenoid tissue in the liver, spleen and various organs are the essential characteristics of the disease. Enlargement of one group lmyph glands calls attention to the disease. Symptoms due to the pressure caused by enlargment of lymph glands or of the organ itself are the next to be noticed. Pressure symptoms may consist of breathlessness, jaundice, ascitis, paraplegia, oedema of extremities. Anaemia is always a later symptom. Liver and spleen are appreciably enlarged. Pel Ebstein type of temperature is a marked feature of the disease. Blood shows marked secondary anaemia. Eosinophilia may be occasionally seen.

Diagnosis.—In early stages with enlargement of one group of

glands the disease may be mistaken for tuberculosis, syphilis or septic adenitis. *Diagnosis from tuberculosis is difficult as according to* one theory the disease is believed to be due to bacillus of Avian Tuberculosis. Progressive Anaemia with hyperplasia of lymphatic tissue and appearance of pressure symptoms suggests the diagnosis. The diagnosis can only be made with certainty by examinations of sections of lymph gland. The lymph tissue is found to be infiltrated by endothelial cells and finally replaced by reticular fibres.

Course.—The acute cases terminate within 3-4 months while the more chronic ones pull on even for 3-4 years. The disease makes a steady progress and sooner or later death occurs either from pressure symptoms or from gradual exhaustion.

Treatment.—No treatment has been known to cure the disease. Excision of the affected glands can only delay the progress. X-Ray exposures help to diminish the size of glands and thus to ameliorate pressure symptoms. Arsenic influences the anaemia and the general condition. Use of Radium may be thought of.

6. **Lederer's Anaemia.**—The condition was described by Lederer in 1925. It is a rare type of acute hemolytic anaemia. It develops with dramatic suddenness. In the absence of obvious haemorrhage the onset suggests acute hemolysis. There is marked pallor with evidence of damage to the marrow. Jaundice and haemoglobinuria may occur. Lederer himself described 6 cases under three years of age. In 1931 Prof. Parsons described four cases independently. These are almost all the cases on the record up to now. Lederer thinks that the anaemia is of infective type. But there is no consistent evidence in support. The only treatment that is of any avail in tiding over the crisis is blood transfusion. Iron helps in restoring the blood condition later on.

7. **Nieman's Disease.**—It is also known as Nieman Pick Syndrome. It is a disease of young infants. Following are the main features :—

(1) Enlargement of abdomen.
(2) Bronzing of the skin.
(3) Raised cholesterol content of blood.
(4) Nervous complications consisting of retraction and increased muscular rigidity.
(5) Progressive anaemia and cachexia ultimately ending in death.

Diagnosis can only be made by examination of sections of spleen. In Nieman's disease the cells are loaded with cholesterol.

Diagnosis from Gaucher's Disease is difficult since in Gaucher's disease we find abnormal products of fat metabolism in splenic Giant Cells. Hence Stransky of Vienna suggests the name "Giant Celled Spleno Hepatomegaly" for both.

8. **Hemolytic Jaundice.**—It occurs as a familial and rarely as an acquired condition. It may make its appearance at birth or later on in childhood. Varying degree of jaundice with an enlarged spleen and increasing anaemia form the characteristic picture on examination. Syphilis, Tuberculosis or some chronic infection is believed to be the pre-disposing factor in the acquired condition.

Diagnosis.—The fragility of R. B. C. is increased and is diagnostic. Syphilis and tuberculosis should be ruled out. Urine will show bile during severe exacerbations. Excretion of Urobilin will be found to have increased many times the normal.

Course.—In the mild type the child may live up to the advanced age. More severe cases get worse during an exacerbation while the most severe cases are permanent invalids. There is no tendency to spontaneous recovery.

Treatment.—Splenectomy has given wonderful results. Though the fragility of R. B. C. does not return to normal after splenectomy, with the removal of the destructive factor, the jaundice and the associated symptoms rapidly ameliorate. Since regenerating power of the blood is not impaired, blood rapidly returns to its normal condition. When splenectomy cannot be undertaken repeated transfusions of blood in combination with liver therapy and accompanied by careful dieting and by general hygiene may be useful.

9. **Infantile Biliary Cirrhosis of Liver.**—The condition is common in childhood. The liver and spleen are greatly enlarged. Jaundice is common and ascitis appears towards the end. There is a marked secondary anaemia. Irregular pyrexia may be present. Development is arrested and puberty postponed. The condition is believed to be infective in origin.

The treatment is in most cases of no avail and patients succumb within a year.

Treatment.—Calomel in fractional doses at intervals of a few days helps to improve the condition. Urotropin and Salicylates should be tried. Mag. Sulph in concentrated solution should be given in the morning when the patient is fasting to promote biliary drainage.

Anaemias of the third group, the so called primary anaemias are rarely seen in childhood. They are so called because their occurrence is not associated with any known cause. The following conditions are included in the group:—

(1) Pernicious Anaemia.
(2) Chlorosis.
(3) Aplastic Anaemia.
(4) Sickle-celled Anaemia.

1. **Pernicious Anaemia.**—The condition is almost unknown in infancy and early childhood. Some authentic cases in children have been recorded but they are very few. The symptoms come on insidiously with weakness, progressive pallor, yellowish tinting of the skin and tendency to haemorrhages. It shows the same blood changes and high Colour Index as in the adult. It is marked by the same hemolytic crisis and it responds to liver therapy reinforced by blood transfusions as in the adult. Comparatively very large doses are required to control the blood destruction in children which perhaps is due to the greater demand on the hemopoietic system in the growing child.

2. **Chlorosis.**—The condition is known to occur in girls at about puberty. It is becoming rare as the importance of hygiene is being realized. The onset is insidious with greenish pallor, weakness, anorexia, occasional epigastric pain, nausea, vomiting and some type of menstrual trouble. The characteristic feature is the diminution of haemoglobin out of proportion to the number of R. B. C., thus giving a low Colour Index. The spleen may be eularged.

Diagnosis from Tuberculosis and nephrosis is important. Wassermann Reaction will distinguish it from Syphilis.

Treatment.—Iron in massive doses is of definite value.

Blaud's Pill in 30–60 gr. doses should be given.

Nutritious diet and open air are of paramount importance.

3. **Aplastic Anaemia.**—It is a condition occurring in early childhood. It may be considered as the analogue of Pernicious Anaemia occurring in adults. The onset is insidious with lassitude, breathlessness and increasing pallor. Irregular fever may be present. Spontaneous haemorrhages are indicative of an advanced stage. Haemoglobin and R. B. C., are diminished rapidly so that there is a low rather than a high Colour Index. Nucleated erythrocytes are almost absent as the disease is due to failure of the Erythron (The Hemopoietic tissue). Platelets are diminished. The aplasia may be a congenital defect or due to the action of some toxin

inhibiting the normal function of the marrow. Diarrhoea is not present and urine does not show Urobilin because the anaemia is not due to the destruction of R. B. C., but to absence of new formation of them.

Course.—Remissions are rare and the disease steadily deteriorates to a fatal issue as a rule. Very rarely the condition after some months may progress to health.

Treatment.—Transfusion seems to be the only therapeutic measure which can be depended upon. Palliative treatment is the same as in other anaemias.

4. **Sickle-Celled Anaemia.**—This condition was first described by Herrick in 1910. Only about nine cases are on record, all of them occurring in Negroes. The condition is familial, hereditary and present from birth. There is marked anaemia and jaundice. Other symptoms are dyspnoea, cough, palpitation, dizziness, weakness and slight fever. Its peculiar type of poikilocytosis distinguishes it from other conditions. This remarkable feature is seen in the changes produced in the red cells in a fresh sealed preparation of blood. In 18–24 hours there is an extraordinary development of crescentic and stellate forms with their active phagocytosis by the endothelial mononuclear and rarely by polymorphonuclear cells, thus allowing easy destruction. There is marked diminution of R. B. C., and haemoglobin with a leucocytosis of about 20,000. Many elliptoid cells are present. Normoblasts are numerous. The condition of the blood is also described as Meniscocytosis. Another intersting feature is the occurrence of leg ulcer. There may be general enlargement of lymph glands. Liver and Spleen are enlarged. Blood shows indirect Van den Bergh reaction. Nutrition suffers badly. The disease is dangerous in children. The disease may remain latent in childhood, when it can only be diagnosed by blood examination. It *per se* does not shorten life but intercurrent infection is likely to prove fatal. Sycklaemia is a harmless condition unless it ceases to be latent.

Treatment.—Splenectomy is followed by transient improvement. Blood transfusion and liver therapy have been tried but no permanent cure is on record. There is no specific treatment for the condition.

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A SHORT SURVEY OF OUR PRESENT KNOWLEDGE OF INFANTILE BILIARY CIRRHOSIS AND SOME REFERENCE TO THE PROBLEMS CONNECTED WITH IT*

BY

RAO BAHADUR T. S. TIRUMURTI, B.A., M.B.C.M., D.T.M., & H. (LOND.),

Professor of Pathology, Medical College, Vizagapatam.

AND

M. V. RADHAKRISHNA RAO., M.B., B.S.,

Tata Research Scholar.

From the Department of Pathology, Medical College, Vizagapatam.

Introduction

EVER since the syndrome, of what is at present termed as *Infantile biliary Cirrhosis*, was brought to the notice of the Medical Profession in India by Sen (1887), much literature has been published on it. In a previous paper (Tirumurti and Radhakrishna Rao, 1933) we briefly reviewed the available literature with the idea of placing the views of different observers about its etiology. In the present paper we wish to present a short survey of the present knowledge of the disease and incidentally refer to some of the problems connected with it.

History

In a paper on 'Enlargement of Liver in Children' read before the Calcutta Medical Society, Sen (1887) brought to the notice of the Profession his observations on a peculiar enlargement of the liver in young children in Calcutta. He gave a good clinical account of the disease and suggested that Malaria, syphilis and chronic suppuration did not seem to be connected with the disease. In the absence of postmortem examinations in fatal cases, the enlargement of the liver was variously considered as fatty or amyloid degeneration (Jogendranath Ghose, 1887),

* A paper read at the 4th Andhra Medical Conference, (Bezwada, March, 1934), and specially sent for publication in the Pediatrics number of '*The Antiseptic*.'

chronic hypertrophy (Rakhaldas Ghose, 1887), cirrhosis 'caused by chronic congestion due to high temperature' (Birch, 1887) etc. Gibbons (1888, 1890 and 1891) described in detail the pathological anatomy of the disease in five cases. He pointed out that the disease is biliary or hypertrophic cirrhosis. When the disease was first described there was some difference of opinion, whether it could be classed as a separate clinical entity and whether it was not a form of Kala-azar (Castellani and Chalmers, 1919). But the amount of literature which has been published since the disease was first described and the case reports from different parts of India are ample proofs for the disease being considered as a definite entity, not associated with Kala-azar.

Epidemiology

In his paper on 'The Epidemiology of Infantile Biliary Cirrhosis of the Liver' Mukherji (1929) gave several important points regarding the epidemiology of the disease. The disease is more prevalent in the eastern plains of the Madras Presidency and Lower Bengal. Cases have been reported from time to time from the United Provinces and the West Coast of India. Mukherji has also pointed out that no case of infantile biliary cirrhosis 'has been reported from Assam, the hot-bed of Kala-azar.'

In Bengal the disease is mainly prevalent in Hindu children, though Mohammedan children are also affected to a slight extent. It is rare among the Christians and Anglo-Indians. Green-Armytage (1926) reported 27 cases of the disease occurring in the European or Anglo-Indian children. In the Madras Presidency the disease is more prevalent in the Southern Districts amongst the Brahmin families. Our experience in the Circars shows that the disease is commonly seen in the Hindus, especially, the Brahmins and 'Vaishnavites' of the middle and rich classes. During the last two years no case of this disease was seen by us in the European, Anglo-Indian, Christian or Mohammedan families. The prevalence of the disease in the Mysore State has been reported by Sankara Iyer (1931). He pointed out that ninety per cent of his cases were amongst the Brahmins.

The available statistics point to the greater incidence of the disease among the male children than the female ones. In our series of 28 cases, 17 were males, while 11 were females. 'The first child of the parents and the first male child after several female ones seem to be affected more' (Mukherji).

The disease cannot be strictly termed 'congenital', as its

onset is generally after the age of six months. Several cases have been reported in which children of the same mother succumbed one after another to it.

The disease generally affects children between the ages of six months and three years. It is rare to find cases before the sixth month or after three years of age. The highest incidence of the disease is seen between the ages of one and two years. It is during this period that most of the cases attract the attention of the parents or the medical attendants.

Mukherji (1921) has shown that the disease is not seen in places over 1,000 feet above the sea level, it has no particular seasonal incidence and does not appear to be a site or house infection.

It has been observed that the disease is more common in the children of the middle and rich classes than in those of the poor. Also our experience in Vizagapatam supports that observation. The disease is very rare in poor class children, though dietetic irregularities are more common and gastro-intestinal disorders more frequent in them.

Signs, Symptoms and Laboratory Findings

The onset of the disease is slow and insidious and hence it is difficult to obtain exact data about its early stages or to fix up the exact age period of its onset. We have been able to record the early signs and symptoms in a few cases, which were vague at the beginning but later on developed the typical manifestations of the disease.

To facilitate description, the disease is generally described in three stages, though clinically or pathologically, there is no sharp demarcation between one stage and the next.

1. **The first stage or the stage of onset of the disease.**—The healthy and active child gradually becomes dull and morose and prefers to lie on the ground. The child may have a voracious appetite or craving for abnormal foods. The bowels are generally constipated but sometimes there may be alternate diarrhoea and constipation. Even at this stage there may be a rise of temperature. The skin loses its glossy appearance and may become muddy. Sometimes sleep is disturbed in the night.

On physical examination enlargement of the liver can be noticed even at this stage. The organ is usually not tender.

Laboratory findings in this stage are nothing definite. Examination of the urine and motion reveal nothing abnormal, while

the blood may show lymphocytosis, which is only perhaps normal for that age period.

2. **The second stage or the stage of enlargement of the liver.**—Most of the cases are diagnosed during this stage, either by the medical attendant who is called in for some other intercurrent affection, or by the parents themselves.

The child is irritable and peevish. Fever is more marked in this stage and is usually of an irregular, intermittent type, though rarely it may be of a low remittent type. Constipation is more marked and the stools are of a dirty whitish colour.

On physical examination, there may be a sub-icteric tint of the conjunctivae, though there is no 'overt-jaundice'. The abdomen may be prominent in the right hypochondriac and epigastric regions and the liver is definitely enlarged reaching to a level of the umbilicus and sometimes even beyond it. It is not tender, is smooth on its surface and firm, with a sharply defined margin, which is thin and hard. A few prominent superficial veins on the abdominal wall may be seen even in this stage. Enlargement of the spleen may not yet become noticeable.

Laboratory findings.—The blood shows a definite leucocytosis with preponderance of the lymphocytes. The Van Den Bergh reaction is direct, "delayed", while the fragility of the red blood cells is either normal or diminished. The urine shows urobilin in a fair concentration. The total fatty content of the faeces may be increased.

In one of our cases we found a low fasting blood-sugar in this stage.

3. **The third stage or the stage of contraction of the liver.**—In this stage, the signs and symptoms are mainly due to the increasing jaundice and later on to portal obstruction. The clinical picture is typical.

The child loses interest in the surroundings and towards the end may be semi-comatose. All the visible mucous membranes are icteric and in fair children the skin also may show the icteric tint. The abdomen is protuberant and in the last stages of the disease there is ascites. Superficial veins on the anterior abdominal wall are more marked. The terminal clinical picture is one of general anasarca, deep jaundice of all the visible mucous membranes and sometimes of the skin and ascites. Sometimes children are carried away by other inter-current affections in the beginning of this stage before the onset of ascites. Emaciation is not a usual clinical feature.

After the onset of ascites, it is difficult to palpate the liver and spleen due to the tense abdomen. In one of our cases the pressure symptoms of the fluid in the abdomen were so marked that a paracentesis of the abdomen was considered inevitable. It may be remarked here that these children tolerate paracentesis of the abdomen very badly, the operation simply hastening the end. The liver in this stage is smaller than in the previous stage, but is still palpable below the costal margin and hard with a smooth surface and a sharp edge. Enlargement of the spleen is a constant feature in this stage.

Sometimes petechial haemorrhages and gastrointestinal haemorrhages may be noticed towards the end.

The urine is scanty and high coloured and deeply bile stained. Urine stains the clothes yellow, while the stools are typically dirty, clayish in colour, and offensive.

Irregular and intermittent fever may be present also in this stage.

Laboratory findings.—The blood shows slight secondary anaemia. Leucocytosis is not a common finding in this stage. The coagulation time of the blood is delayed and the fragility of the red blood cells diminished. As the jaundice grows intense, the Van Den Bergh reaction becomes "Direct, Immediate." In one of our cases, the urea and the non-protein nitrogen were estimated and found normal. Hyper-glycæmia is said to be a common feature in the second and third stages, but in all our cases in which the fasting blood-sugar was estimated, it was found to be below the lower limit of the normal.

Bile salts, bile-pigments and urobilin are present in the urine in high concentration. A trace of albumin is present in the urine, but it is not usual to find casts or crystals. Degenerating leucocytes and epithelial cells from the bladder may be found in the urine in the last stages. In this stage, culture of the urine may show B. coli or B. Fæcalis alkaligenis. The microscopic examination of the fæces is generally negative for ova of helminths, amoebae or charcot-Leyden crystals.

The liver function tests show diminished function of the liver.

The ascitic fluid is a transudate and may be deeply bile stained. In one of our cases intraperitoneal inoculation of the ascitic fluid into a guineapig was negative, while the culture of the same fluid showed an organism which did not conform to the usual bacteriological tests of the known pathogens.

The formal-gel test (Napier) and the agglutination tests with dysenteric organisms (both of the blood serum and the ascitic fluid)

are negative. The Wassermann reactions of the blood of the child and of its parents are usually negative. In one of our cases in which we had an opportunity of verifying the clinical diagnosis by a thorough post-mortem examination, both macroscopic, and microscopic, the Wassermann reactions of the blood and the ascitic fluid were strongly positive. This is an example of cases in which the clinical diagnosis of Infantile biliary cirrhosis would have certainly been questioned, on the strength of positive Wassermann reactions alone. We only wish to point out here that other stigmata of congenital syphilis should be searched for and also taken into consideration before a positive Wassermann reaction is accepted as a definite proof of congenital syphilis.

Pathology

The existing literature on the subject is mostly clinical and we have not therefore materially advanced in our conception of the pathology of the disease. Apart from the papers published by Gibbons, no further attempts have been made, so far as we are aware, to study the morbid anatomy and pathology of the disease.

Gibbons (1888,1890 and 1891) gave a detailed description of the morbid anatomy and pathology of the disease in five cases. In his opinion it is a peculiar type of biliary cirrhosis in which the fibrosis commences in the tissues around the minute bile ducts causing early jaundice and interferes with the portal circulation only late in the disease. The distribution of the fibrous tissue is inter-cellular in nature and in the newly formed fibrous tissue many bile ducts, some newly formed and others pre-existing, are evident. The liver cells show marked destructive changes. According to him the disease is probably due to the absorption of chemical irritants of gastro-intestinal origin which are carried to the liver and in the process of their elimination in the bile set up inflammatory changes around the bile ducts. This conclusion was strongly supported by post-mortem evidences.

The next important contribution to the study of the Pathology of the disease was made by Ramachandra Rao (1933). According to him the condition is one of sub-acute 'toxic cirrhosis.'

The junior author is at present engaged in an extensive study of the histo-pathology of the liver in these cases, and his results might throw further light on the subject.

The spleen shows passive venous congestion. The epithelium of the uriniferous tubules of the kidney may show degenerative changes.

Modes of Termination

In those cases which were followed to the end, the children gradually developed cholæmia and died. In one case the death was due to broncho-penumonia. Though Mukherji (1922) pointed out that profound cachexia is one of the modes of termination, we have not seen any such. The cause of death in rare instances may be due to a severe gastro-intestinal haemorrhage.

Diagnosis and Differential Diagnosis

It is not always easy to diagnose the disease, with certainity in the early stages. The causes of enlargement of the liver are many. Therefore a systematic and thorough examination is necessary for a correct diagnosis. Unfortunately there is no reliable diagnostic criterion to spot out the disease in its early stages, when treatment might be of some avail. Hence, it is better to view with suspicion any enlargement of the liver in a child, in whom no appreciable cause for such enlargement could be found, and treatment started early. The painless enlargement of the liver, the irregular intermittent fever, the sallow complexion, the persistent constipation, the gradually deepening jaundice, the terminal portal obstruction and enlargement of the spleen, are some of the important features which must be borne in mind in diagnosis. The terminal picture is fairly typical and there is not much difficulty in diagnosing it at this stage.

In his treatise on 'Infantile cirrhosis of liver', Mukherji (1922) has discussed at length the differential diagnosis of the disease. The common tropical diseases like malaria and kala-azar should be eliminated. It may be pointed out here that the liver is normally palpable in the child till the second year, and it should not be mistaken for an enlarged liver. In the differential diagnosis of the disease, congenital syphilis should be eliminated after a thorough clinical and laboratory investigation and if possible by a therapeutic test. In some cases this disease may present real difficulty in the differential diagnosis. Acholuric jaundice, catarrhal jaundice, Hanot's biliary cirrhosis, Rickets, enlargement of the liver due to passive congestion, fatty infiltration, waxy disease, new growths, etc., are some of the other conditions which should be borne in mind in differential diagnosis.

Simple enlargement of the liver without any other signs and symptoms due to accumulation of glycogen in the glandular cells of the organ has been described (Von Gierke's type of hepatomegaly), but, so far, no case of this kind has been described in India.

This condition also may be kept in mind in the differential diagnosis of Infantile biliary cirrhosis.

Prognosis

The prognosis is favourable if the disease is diagnosed early and treatment begun before the onset of jaundice. The onset of jaundice generally heralds in a bad prognosis, as recovery is rare after its appearance. Other factors which influence the prognosis are, a history pointing to several children in the same family having been similarly affected, early onset of the disease *i.e.*, before the tenth month and a rapid course. On account of the insidious onset of the disease, most of the cases are diagnosed at a stage when the disease is fairly advanced ; consequently, the response to treatment is poor and the mortality is usually high. Recovery is seldom after the appearance of general anasarca and ascites.

Treatment.—In the present state of uncertainty about the causation of the disease, treatment, at best, can only be symptomatic.

Proper ante-natal care of the expectant mother, and careful dieting of the child after its birth, are important measures to be remembered in prophylaxis.

Of the several drugs used in its treatment, Mercury with chalk and compound rhubarb powder form a favourite combination. *Cirobil* (*Confectio Hedyotis Auricularia*) is another preparation which has been used with advantage in some cases of liver enlargement in children. We gave a fair trial to Liq. Kalmegh Co., (Indian Medical Laboratory, Calcutta) and found it very beneficial, especially in the early stage of the disease. It is given in doses of 10 to 15 drops three times a day. Various other patent and proprietary preparations, some reputed to be specifics, have been put on the market and no attempt has been made so far to systematically study the therapeutic value of these several preparations and compare their efficacy in treatment.

Careful attention should be paid to the diet of the child. Fats are not well tolerated and the 'skimmed milk treatment' described by Green-Armytage (1926) may be followed with considerable benefit. Goat's and Ass's milk have also been advocated.

For the relief of the general anasarca and ascites, apart from the routine treatment, Salyrgan may be tried with caution, if the kidney is fairly healthy. If the pressure effects of the fluid in the abdomen are very severe, paracentesis has to be resorted to. As a rule, these children do not stand the operation well.

Auto-vaccines from the urine are also advocated, but their beneficial effects remain to be determined.

The details of the general, hygienic and dietetic treatment do not require any special mention here.

Aetiology

What is the cause of Infantile Biliary Cirrhosis ?—Though it is more than four decades since the disease was first described and accepted as a definite entity, the above question still remains to be answered. In a previous paper (Tirumurti and Radhakrishna Rao 1933), we have briefly summarized the views of different observers on the causation of the disease, and pointed out that the majority of them are of the opinion that the disease is mainly traceable to irregularities in the feeding of infants.

While not denying the importance of dietetic errors in its causation, we wish to suggest that the question should be tackled with an open mind, so that the other suggestions regarding its aetiology are also duly considered. As a result of an investigation into the dietetics of normal children in this part of India, we have found that the feeding of children, especially in the poor and lower middle classes is very unsatisfactory and the resulting gastro-intestinal disturbances are extremely common in them. Yet, the occurrence of infantile biliary cirrhosis in them is very rare. Moreover, our observations also point out that the diet of children affected with the disease did not differ materially from that of the normal children of the same age and of the same class. Before the causation of the disease is attributed to dietetic irregularities, a more thorough investigation into the diets of normal children of the same class and community is necessary for comparison.

Is it a virus disease? If so, how is it conveyed to the child? This problem is still open for investigation and no work has been done so far, to prove or disprove this theory.

In a previous paper we have observed :—

"The fever and the leucocytosis in the early stages of the disease, its progressive nature, the rapid course, and the invariably fatal termination, in most cases, when the disease had fully developed, point to the possibility of a subacute toxic infection, the nature of which remains to be determined".

The recent work of Ramachandra Rao, already referred to, on the pathology of the disease, also points to the disease being in the

nature of a toxic cirrhosis. Further investigation on the lines of his research may throw additional light on the aetiology.

According to Pearse (1909) the disease is probably parasitic in nature. The work which has been done in this direction is not conclusive and further investigation is necessary before its exact role in the causation is determined.

Comment

The correct figures about the mortality of the disease are still not available, as no statistics on it are maintained even in areas in which the disease is very prevalent. The high toll of life in infants due to this disease in Calcutta can be gauged from the statistics collected by Mukherji (1922) between the years 1908 and 1920. Pearse (1909) gave the statistics of death from Infantile billary cirrhosis in the same city in 1907. These statistics point to the highest mortality amongst Hindu children, generally between the ages of one and two years. An attempt should be made to regularly maintain the statistics of death due to this disease in all the big cities, so that mortality figures can be ascertained for future guidance.

Malaria, Kala-azar, congenital syphilis, alcoholism in parents, amyloid degeneration, parasitic infection, vitamin deficiency, defects in mother's milk, gastro-intestinal toxins, over feeding, etc., have been, from time to time, attributed to be important aetiological factors. Our present knowledge of the disease is mainly clinical and a more thorough investigation including laboratory examination is essential to a proper study of the aetiology of the disease. Though the mortality due to this disease is stated to be high, the morbid anatomy and pathology of the disease has been rarely studied and recorded. This is largely due to the fact that it is difficult to obtain autopsy in these cases, as most of them are generally from the rich and middle classes.. To unravel the aetiology of the disease, complete post-mortem examinations in a large number of cases, is very essential and every attempt should be made by the members of our profession who have been in charge of such patients to collect autopsy material for investigation from the fatal cases.

Another point to be remembered in discussing the aetiology of the disease is that it is peculiar to India, (though a few similar cases have been reported from Mexico and North China), and it is more prevalent in certain endemic areas. If the disease is only due to metabolic disturbances or dietetic errors alone, why should

it be peculiar to, and more prevalent in, certain areas only in India?

A complete investigation of the disease should include examination of the parents as well, especially the mother of the child. The several speculations regarding defects in the mother's milk causing the disease, have not been substantiated so far. Analysis of mother's milk in these cases, whenever possible, and in a number of healthy controls may throw additional light on this problem.

In most of the cases in which dietetic errors were attributed to be mainly responsible for the causation of the disease, data regarding the feeding of the normal children of the same age and class are not available for comparison. A more detailed study of the diets of the affected children and those of normal children of the same age and class for comparison, would be found useful for determining the role of dietetic errors among the causative factors.

Treatment, to be effective, should be begun early. Early treatment is only possible when the disease is diagnosed early. As pointed out before, early diagnosis is not easy and is mainly based on clinical findings. Hence, further investigation should also include a search for a reliable diagnostic test based on the biochemical, bacteriological, clinical, pathological, or other findings, so that an early diagnosis can be made with certainty to begin treatment sufficiently early.

Until our knowledge of the disease is more advanced, the treatment can only be empirical. The specific nature of the disease, and its specific treatment still remain to be determined. This is only possible by a more thorough investigation of the disease in all its aspects.

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NAUGHTY CHILDREN: THEIR PROBLEM AND MANAGEMENT

BY

DR. M. V. GOVINDASWAMY,

(Mysore Medical Service), Worcester State Hospital, Massachusetts.

I

The Child Guidance Clinic

THE problem of behaviour disorders in children is best approached by spending a day observing the activities at any Child Guidance Clinic. On entrance you usually find either to your left or to the right side a big room where you find some children happily playing about. This is a waiting room for children and occasionally is sprinkled with an anxious parent or two. The walls are full of pictures illustrating the lives of heroes and heroines and incidents in fairy tales, Jack the Giant Killer, Red Riding Hood, and perhaps Cinderella, with plenty of pictures of Father Christmas and Santa Claus scattered about. In a corner you find a big box full of blocks around which a group of happy children are usually constructing buildings and palaces of phantasy and reality. Toys, teddy bears, mechanical coaches, waggons, and automobiles are scattered about in plenty, as well as picture books. The atmosphere is more that of a nursery in a well governed establishment rather than a clinic where children who are obviously unmanageable are brought for treatment.

If you proceed further you come across a room marked "Information" wherein there is usually a pleasant lady interviewing a distressed or an anxious parent. The hysterical mother might be explaining, striking up extravagant attitudes, "I don't know what to do. I wish I were dead. I told her that the only thing I could do was to kill her because she was bringing such a disgrace on the family, and the answer she gave me was, 'Wouldn't I have swell funeral'." Or, perhaps, it might be a rigid father with a bristling moustache who is exclaiming, "I won't have it! He is bringing disgrace on the whole family! He has stolen four cars for a joy-ride. I have brought him up so carefully and expected him to succeed to my business, and he has not only brought about the ruin of his career but also has destroyed all my ambitions". By that time perhaps there is a letter wherein a schoolteacher is referring a child for having stolen twenty dollars from her pocket, and she adds, "Ordinarily he is such a nice boy. He

is so good and well disciplined. But he has a nasty habit of turning over the purses of every visitor, and now I am distressed beyond everything because he has stolen the school money. I hope that something might be done about it." Or it might be a telegram from a Judge of the Juvenile Court referring a boy for setting fires to haystacks in pure mischief, or for an attempted burglary. Incidentally it might also be a mother who is overscrupulous and cleanly complaining that a child is always lying or that in spite of all her threats and punishment she has not been able to teach him toilet habits and that he persists in nail-biting and thumb-sucking, eats like a pig, and masturbates shamelessly. The Social Service Worker at the Information Bureau smiles pleasantly, tries her best to calm or to soothe each one of her visitors in turn, and attempts to select out of the whole group perhaps some which show urgent need of treatment and which she thinks might benefit from treatment. A few words of comfort to the parent and an understanding of the history and the situation, and the parent goes away greatly comforted.

Perhaps in the meanwhile one of the psychologists has come down, and leading one of the children in the playroom gently by the hand, takes him up to find out by psychological tests his interest in the work and his growth of intelligence. In another room a physician is trying to examine the child for any physical ailments, essentially any endocrine deformities, epilepsy, chorea, post-encephalitis, or any other abnormalities which might throw light upon his recalcitrant behaviour. In another room perhaps a child who stammers or shows considerable speech difficulties is undergoing some relaxation exercises preparatory to an intensive treatment of the speech ability, the relaxation aiming at reducing any emotional resistance to the situation. The speech difficulty might not, however, be organic. It might perhaps be a symptom formation due to a tense emotional situation. The unravelling of the emotional situation and a gradual readjustment of correct speech patterns by kindliness and practice regularly has brought the present child on the way to recovery.

Next perhaps we proceed into the psychiatrist's room where the doctor has gently and firmly established or is trying to establish a rapport with the patient, and having gained his confidence, is doing his best with intensive therapeutic interviews to attempt not merely the solution of the symptom, which means nothing, but to remove the underlying causes which are started with dynamic distortions. Or may be it is a conference in progress

between the psychiatrist, the Social Service Workers, the psychologist, and representatives or welfare agencies. A case has been studied and they are trying to outline what method of treatment to follow, each working on a different section, but all trying to co-operate towards the same end. It might be the placing of the child in a foster-home or referring him to a reformatory, or explaining to the parent that he is at fault and that he should alter his attitude or send the child to a different school or else perhaps to a pediatrician. And so it goes, and another day is over.

In America there are more than forty-five Child Guidance Clinics, amongst which about half a dozen are outstanding. Amongst them might be mentioned the Worcester Child Guidance Clinic, the Philadelphia Clinic, the Judge Baker Foundation at Boston, one at Chicago, Iowa, Ohio, and Dr. Levy's Clinic in New York. Most of these are research institutions and their value to the community is being increasingly recognized.

II

Some Etiological Factors

Children usually referred to clinics give considerable trouble at home because they suffer from disorders which could be broadly grouped under two headings, behaviour disorders and personality disorders. Amongst behaviour disorders might be mentioned irregular habits, such as soiling, enuresis, stealing and lying, and temper tantrums. Amongst personality disorders the commonest are fright and anxiety reactions, overseclusiveness, aggression, intense shyness, and phantasy and day-dreaming to a morbid degree. Delinquency might be included in either of the two groups, but perhaps with more justification under behaviour problems. There is developing an appreciation that mental phenomena are understandable as scientific facts with a genetic background, which, if understood, show why behaviour problems develop in the first place and the purpose the problem behaviour serves as it continues. This point is best illustrated by the following situation. A fourteen-year-old boy gives a history of many years of rebellion against various forms of authority, resulting in his expulsion from several schools. He was the only boy of parents who were poorly adjusted to each other. They separated, and the boy lived with the mother and her family. To the mother this boy was always identified with two difficult things in her life, which prevented a normal relationship between mother and son. He represented all

the unhappiness associated with her marriage. He was identified with all the difficult traits possessed by the father. Every time he showed any difficult behaviour the fear was aroused that he would be like the father, and as he grew he showed more and more reactions of a rebellious, over-assertive type. Efforts to eradicate the behaviour were severe and continuous, and the rebellion of the boy against this began early and continued. He had no secure place in the love life of his home, and as a result he had little opportunity to gain any sense of his own values. In the group he became over-assertive because he was shy and afraid of being called " yellow. " His rebellious behaviour came to have two values to him. It had the effect of drawing attention to him, and secondly it served as a method of punishing his mother for her treatment of him. These values have continued. This boy's behaviour becomes understandable in terms of his own background and relationships. Treatment, to be effective, must bear a close relationship to the things that have kept the turmoil going.

Psychiatric work with children has taken the physician into a broad field of human activity which has extended far beyond the confines of abnormality and diseased conditions. It has been concerned with knowing the child as a unit within himself, with an emotional life and a physical organism peculiarly his own. His physical responses are seen as the external expressions of attempts to bring about a harmonious and satisfying adjustment to a variety of situations. The child himself must be understood for what he is and for what he seems capable of being. The realization of this has led to a real appreciation of the dynamics of family life and the emotional problem that each individual brings to it. Work with children has emphasized the importance of knowing parents as well as children and of appreciating the things that have formed their own background and influenced the attitudes they have not only toward the children but toward their own adult situations. The understanding of the emotional background of the home has become one of the important objectives in work with children. The emphasis on the broad understanding of the child and his relations has made increasingly apparent the futility of classifications that are dogmatic and frequently misleading. Formal classification has had a stunting influence on adult psychiatry by focusing more attention on the symptom than on the dynamics of the symptom. The breadth of the children's field and their immaturity and capacity for growth has made impossible any extensive scheme of

formal classification and the use of terms suggestive of definite entities.

Many of the phenomena of these so-called problem children such as faulty habits of eating, sleeping, elimination, etc., are normally to be expected at certain ages. The psychoanalytic approach to child development considers that many habits and many personality and behaviour trends frequently classed as undesirable are natural manifestations in one or another of the early stages of psychosexual development in the pre-school years. For example, thumb-sucking and other oral habits are characteristic of the oral phase of sexuality in the first twelve or eighteen months of life. Cruelty and destructiveness are an accompaniment of a phase during the second and third years, while jealousy, lying, emotional ambivalence, sex curiosity, and sex play are likely to appear in the fourth and fifth years when the genital and Oedipus stages are dominant. The criteria for differentiating between adjustment and mal-adjustment are the persistence of the habits and behaviour characteristics of an earlier stage into later stages or regression to earlier patterns of response.

As regards mental disease in childhood, the serious mental diseases classed as psychoses are not prevalent to any great extent, but perhaps we have got to remember that the 'goody-goody', children who never cause trouble, who are never mischievous, and are occupied solely with themselves, may perhaps be showing the schizoid symptoms. The neurotic and psychoneurotic tendencies are undoubtedly more common. The neurotic difficulties include defiance or stubbornness, failure to respond to training in cleanliness, thumb-sucking and nail-biting, difficulties with regard to food and feeding, aggressiveness, jealousy, shyness, destructiveness, stammering, sleeplessness, and inability to be alone, as well as the more serious probias, night terrors and excessive masturbation.

Emotional frustrations, repressions, and conflicts form the roots of neurotic symptoms at all ages, but it must be added that the neurotic child is very often suffering from a frustration existing in the present while the other neurotic only remembers such frustration and dreads its recurrence.

Gardner has recently published a case illustrating the role of castration fears in the development of night terrors. It is also frequently noted that fear dreams and night terrors may be utilized by the child as a rationalization for desires to sleep with the parents or to call one parent from the other and into the child's bed.

As regards enuresis, emotional factors constitute by far the largest group of elements in the causation or at least the continuance of enuresis. In addition to the mechanisms of frustration, repression, and conflict, Klein has suggested that additional factors may be found in the intensity and kinds of fixations which the child develops, and the kind of superego formed through identifications with the parents is also very significant in the etiology of neurotic difficulties.

The one characteristic of the delinquent child is a rebellious attitude toward authority and environmental restrictions, *i.e.*, he reacts aggressively toward the world. In neurotic children fear and anxiety are often very evident. The difference, however, may be only superficial. Klein observes that pre-school children, whether normal or problem, show impulses and actions in dramatic play and phantasy which, if carried over into later years and out of make-believe into reality, would be classed as criminal tendencies. Upon parent-child relationships to considerable extent depend the varying degrees and amounts of frustration which may be imposed on the child as well as the kind of gratification which may be provided in excess and thus lead to fixations at infantile levels. In the parent-child situations there are frequently acute traumatic experiences or more chronic pathological conditions affecting early psychosexual development. Again parental attitude may reinforce repression or favour sublimation and may foster or impede normal identification with the parents and wholesome superego formation. The psychological aspects of the parent-child situation more than any other single group of factors are important for adjustment or mal-adjustment and for the direction of the latter towards neuroticism, psychotic states, or delinquency.

As regards educational disabilities and speech difficulties, in addition to poor visual discrimination for words and poor auditory discrimination, emotional difficulties of anxiety and inadequacy arising from traumatic experiences outside the class-room may interfere with the efficient functioning of the complex learning processes. Emotional immaturity, negativistic attitudes, infantile behaviour patterns, especially in children who have been nursed or bottle-fed to a late age or who have been over-protected and over-supervised, whose play activities have been restricted and the children subjected to repressive discipline, are obstacles to emotional growth which the child, unable to overcome, has turned back to infantile ways of gaining emotional satisfaction with self-assertion which has become possible only in negativistic ways. As

regards such a child, for example, if he wants a toy in a play-room and if his wants are indicated by gestures, the psychiatrist should not gratify the desire by handing the toy to the child but should show an understanding of it by such a remark as, "You would like to play with the doll, wouldn't you? You may get it and play with it if you like." In a short time the child's desire for the plaything would motivate efforts to gain satisfaction.

III

Treatment

As regards habit training of children, the National Mental Hygiene Council has put forward some very interesting and useful pamphlets. As an illustration might be cited, "How to Train Your Baby To Keep Dry."

Important Dont's

"(1) Do not wait until he is a year old before beginning to train the baby.

If you do, he has already learned the habit of wetting himself. The longer this habit lasts, the harder it may be to break him of it.

(2) Do not shame him, or punish him, or make fun of him, when he wets himself.

It is apt to make him think of his *failures*, when we want him to think of *succeeding*.

Praise his successes, and do not talk about his failures.

(3) Do not use force to make him sit on the "chair," especially if he protests.

If you do, he may wet himself just to make trouble, keep you fussing over him, get even with you, or to satisfy some other of his baby wishes.

(4) Do not make a fuss with him over wetting himself, or over his sitting on the "chair".

If you do, he will learn that that is one way to get attention; and every child likes attention. This may make him want to continue the habit.

(5) Do not suggest to the baby in any way that he cannot learn to keep dry, and do not let any one else suggest it, if you can help it.

To do so gives him an excuse for not trying. He needs to feel that it is up to him to try, and that he can succeed".

So that a child might form good habits, begin when he is born. When he cries do not pick him up to stop his crying. Pick up the baby when he is awake and not crying. Always keep regular hours for food and baths and sleeping. In order that the child may have good food habits, prepare food that is good for children. If the child says he does not like it, pay no attention. Don't allow your child to make you feed him. Don't be afraid that your child will not eat enough and go on promising him something nice if he will eat because he will never eat until you promise him something. Try to make every meal-time a happy, quiet time. Children want attention very much. They will do anything to get attention, even something bad to get attention. When they are punished,even though it hurts, to them it is worth while to be hurt to get attention, which may seem queer but is true. If the children see that they can get attention by being good, they will be good and they will be busy and happy, too. If your child has temper tantrums, that is, if he kicks and screams if you do not let him do what he wants, it may be because he does not get enough sleep or enough play, or you talk too loudly and get angry, which the child imitates. It may possibly be that you will not let him do things for himself. Children want to be independent. You are making them naughty when you do not let them try to do things alone. Remember it does not matter if they do not do as well as you; they will learn after a while. When a child is kicking and screaming, don't pay any attention to him. It might take a long, long time to make him believe that you will not pay attention. Next time he might try again, but he will stop sooner. Always ask for obedience from a very small child in important things, which are going to the toilet regularly, going to bed and getting up at a certain time, picking up his toys, eating his meals regularly, never playing in the street or crossing it without you. He may not obey you if he does not hear you, if you have forgotten what you have asked him to do, or because he is sleepy and tired, or you allow him to do something one day and punish him for doing it the next day, or try to bribe him. More important than all which you must avoid, never scare him to make him do what you want or break your promises to the children. Also, a child likes excitement very much. He often does things he knows are naughty because it is exciting to see you get angry. Tell the truth always to your child. Speak to him quietly. Do not talk loudly in the home. The surest way of teaching children to be naughty is to be nicer to one child than to another, and by trying to make children do

things that are not important to show that you are the boss, laughing sometimes when he is naughty and sometimes when he is good, punishing the children because you are angry, punishing very hard, leaving things around that children want to have, discussing things or arguing with your husband in the presence of children, and punishing them because you are tired and cross.

Some of the more obvious factors in the treatment of children have long been understood and sometimes accepted as the whole story, a healthy body, sensible habit training, good food, fresh air, suitable recreation, intelligent educational opportunities, and harmonious homes, but of particular importance is a better understanding of the parent-child relation and the things determining its healthy and unhealthy aspects. A child's most fundamental need is to be secure in his own home, to feel that he is respected and wanted, not for what he can satisfy in the life of his parents but for his own individual self. Growth involves giving up things and replacing one form of pleasure for another. Frequently it is a painful process. Parents commonly carry into their relationship with their children many unresolved conflicts of their own. A father struggling along from the effects of a deprived love life in his own childhood or a mother clinging to a strong attachment to her own parents are instances of problems found in the emotional lives of parents which frequently enmesh the child. It is useless to blame or lecture children. This arouses only antagonisms. Sometimes the child might even seek condemnation as a means of protecting himself against the opening up of what, to him, are guilt difficulties. Healy gives the instance of a boy who stole a cloak and preferred comments on stealing to prevent discussions over sex.

Klein's chief contribution to child analysis has been a development of the play technique. In the treatment of young children in the clinic the free play situation is extremely valuable. Not only are the child's emotional conflicts portrayed very vividly through dramatic and make-believe play, but emotional development also seems to take place. Interpretations, according to Klein, must be made by the therapeutist, but it is often noticed that the child himself interprets in spontaneous comments upon his activities or in replies to questions. Gesell sees the growth impulse as existing from infancy and as a function of life. There is always the tendency within the individual to strive towards the optimal potentiality for physical and mental development. In the play situation we have provided a situation which leaves the child free to follow his natural impulses and we may logically expect emotional growth to take place and new modes of adjustment to be evolved without much interpretation by the therapeutist.

In the treatment of older children, their own responses, confidences, memories of their sexual experiences, phantasies, and conflicts must be made the basis for adequate outlets and therapy.

IV

It is a far cry from America to India, where ignorance, poverty, and utter carelessness, and a negativistic philosophy make any adequate therapy impossible. Also, psychiatry has come to mean there chronic asylum cases. Medical students who see only in a few fleeting lectures to which they pay no attention some burnt-out cases and think that mental disorder is incurable, become bewildered whenever a mental case presents itself before their eyes. So the greatest enemy of psychiatry seems to be the average practitioner, because he knows so little about it and from his own vanity thinks that anything which does not respond to drugs or a knife can have no assistance. He only too often belittles it, characterizing any attempt at psychiatric treatment as Freud and sex, because of a smattering of psychoanalytical jargon published in newspapers or popular periodicals. The same step-motherly attitude is reflected in the administration, also. One wonders whether things will ever change, and we might almost seem to hear the ironic spirit of time whispering behind our backs, " Wait and see."

CHOREA: ITS NATURE AND TREATMENT

BY

JAMES BURNET, M.A., M.D., F.R.C.P. (EDIN.)

Lecturer on Diseases of Children,
School of Medicine of the Royal Colleges, Edinburgh.

IN this short paper we shall limit our consideration to chorea of rheumatic origin. This is not the only cause, but it is by far the most frequent and important. We have published accounts of cases of chorea in children due to tape worm, and one of the worst types of the disease was encountered in such a case which had been treated unsuccessfully until the correct diagnosis was made. Chorea, however, is mainly of rheumatic origin, and so we shall devote our attention entirely to this variety of the disease.

Its age incidence is from 7 to 15 years, and it is much more common in the female than in the male. The old description of the movements as "wriggling, twisting, shrugging and grimacing" cannot be improved on. As regards symptoms we would emphasize those which herald the onset of the disease. In our experience the two most frequent and prominent early symptoms are nervousness and dullness. The child, as a rule, becomes unduly nervous a considerable time before any choreic movements are observed. Dullness, listlessness and apathy are often more or less marked. The child seems to lose interest in work and play. He or she is regarded as stupid at school and careless in the home. These early symptoms should warn the parent and teacher that rest is needed. We believe the disease might often be warded off altogether if such a child were sent to bed, and kept there at perfect rest for some weeks. The prophylaxis of chorea, in other words, is in our opinion, of very great importance and within the bounds of ordinary possibility. It is however, a matter to which text-book writers never refer. It is all the more important, therefore, that we should emphasize it here as it is a matter which ought to receive great attention. The ultimate cause of chorea is still debated. It will certainly never be discovered by experiment on the lower animals. These may prove fallacious, and postpone the day when the true etiological factor will be revealed to us.

Our main attention must be given to the incidence of heart affections in chorea. Here, again, we consider that too much stress is laid on auscultation of this organ. By percussion we may discover enlargement due to myocarditis, which we believe to be present more or less in every case of chorea, long before the valves are attacked or murmurs become evident. By light percussion slight enlargements are quite easily detected by the experienced clinician. Unfortunately in these days training in physical diagnosis has somewhat fallen off; and our younger men are less experienced, therefore, in the art of percussion and auscultation than their elders were at their age. In every case of rheumatic fever or of chorea the heart should be percussed each day.

As regards treatment we must place prolonged rest first, often on a water-bed. Two months may be necessary, and usually three months from the start will elapse before the patient is completely cured. Of course, if the heart has been involved, a much longer period of rest may be necessary. Next to rest comes massage. It

is hopeless to try to treat a case of chorea without it. Nothing acts so beneficially in our experience as careful and well directed massage of the various muscle groups affected. Warm baths, prolonged for half an hour or even more, are distinctly advantageous. The addition of mustard to the water is to be recommended. The carbon arc lamp acts very favourably in some cases, especially in those which have lasted for some weeks. As regards drugs, as the disease is usually of rheumatic origin, we always give acid. acetylsalicyl. We never prescribe arsenic which cures (?) chorea by producing a mild (or it may be a severe) form of neuritis. But, after all, drugs hold a second place in the treatment of chorea. The other measures we have mentioned are of infinitely greater importance. In addition attention should be paid to the gastro-intestinal tract. We have a preference for hydrarg subchlor, as a laxative in these cases. Diet should consist of milk, vegetable soups, fish, chicken and eggs. In other words it must be light, readily digestible, and highly nutritious.

It is important to warn the parents as to the true nature of chorea, and to advise examination of the child at least twice a year during the school age period at all events. On these occasions a very careful and detailed examination of the heart should be made. Convalescence must never be hurried. It should, if possible, end up with a good holiday at the seaside, and school work should under no circumstances be resumed too soon. A word of warning should be given to the school authorities when the child does return to school as to modification of home lessons, gymnastic exercises, and sport. Attention to clothing will also be necessary, and in general the child should receive very close supervision both at school and in the home.

INFANT FEEDING

BY

DR. M.B. PRABHU, M.B. (MAD.), M.R.C.P. (ED.), M.M- (LOND.)

Madras.

Successful Infant-Feeding is an Art in Itself

SUCCESS depends upon the kind of food as well as on the mode of its administration. Of the two, the nature of the food is more important. The ideal food, the perfect food, is mother's milk. No other food gives such uniform and appreciable success. With all the advance in the knowledge of Pediatrics, it is difficult to find a satisfactory substitute for human milk. Cow's milk is the usual substitute. Its composition and virtues have been studied for the last fifty years or more. All the problems in connection with artificial feeding have by no means been solved. True, there have been a large number of useful contributions on the subject but still there are problems unsolved in this complex and intricate field. The large number of infant foods in the market is a testimony how manufacturers are still trying to find the best modification of cow's milk suitable for infants.

In the out-patient department of a hospital, where about a hundred or more children are presenting for treatment, it is a depressing sight to see more than ninety-five per cent, of them sick and undernourished and almost every one of them has been brought up entirely or largely upon cow's milk. Some two or three cases of well nourished happy children may present themselves, affording a pleasing contrast to the others, and these on inquiry, are entirely breast-fed.

Cow's milk may be modified to a certain extent to suit the child. A great deal of time and care is required in its preparation. But the pit-falls are many and frequent. Gastro-intestinal upsets in artificially fed infants are not beyond the experience of practising physicians. The difficulty of rearing the infant on cow's milk is greater during the first few weeks of its life. Experience shows that in infants, wholly breast fed during their first twelve weeks, introduction of artificial food thereafter is not very difficult. Infants, breast-fed upto a period of six months, easily take to cow's milk and starchy foods.

Again, it is in cases of premature infants that the unsuitability of cow's milk is amply demonstrated. The greater the degree of prematurity, the more is the difficulty. The mortality of premature

infants, fed on cow's milk, has been noticed to be directly proportional to their degree of prematurity, as measured by their birth weight. Thus, whereas in new-born infants, weighing 6 lbs. and over, cow's milk may be made to agree from the outset, in infants weighing 4 lbs. or less, it is only rarely successful. True it is, that once in a way, a report appears of a 2 or 3 lbs. baby reared on artificial foods, but these cases are only medical curiosities.

The advantage of breast-feeding over the most successful artificial feeding has been firmly established. About 80 to 90 per cent of infant deaths between 2 weeks and one year from all causes, occur in bottle-fed infants. The state of nutrition and infection are closely related and breast-fed babies have far greater resistance to infection than hand-fed babies. Wertheimer and Wolff studied a large number of infants and noted the duration of infection as follows:—

AVERAGE DURATION OF INFECTION.

Breast-fed baby	...	0.5 to 1 week.
Healthy, bottle-fed baby	...	2.5 weeks.
Non-thriving bottle-fed baby	...	3.8 ,,
Decomposition and premature baby	...	4.5 ,,

The mortality figures of these infants with infection are striking:—

Breast-fed	...	0% mortality.
Normal bottle-fed	...	10 to 28% ,,
Premature and non-thriving	...	40% ,,
Decomposition (*i.e.*, marasmic).		90% ,,

I could not but deal with this subject at length because it is not sufficiently realised that the difficulty of feeding infants is to a large extent due to the initial mistake of not taking proper steps to ensure breast-milk for the infant. Various preparations of cow's milk are so widely advertised that the laity and even the professional men may unconsciously look upon substitution of cow's milk for breast milk as of a trivial nature. Unless the Physician is convinced of the unbounded superiority of breast milk over the most elaborate preparations of cow's milk, he cannot do justice to the subject of infant-feeding. This is particularly so in our country where the standard of literacy and living of the

masses is such that artificial feeding, at its best, will give us far inferior results to those obtainable in Western countries.

Breast Feeding

For successful lactation, preparation should be made from the time of pregnancy. Chronic ill-health and debilitating diseases interfere with proper development of the breasts, and make breast-feeding difficult, if not impossible. Therefore due care should be taken of the mother during the antenatal period.

The care of the nipples during pregnancy is important. This is a point sometimes ignored. It is well within my experience that where the mother had good health, abundant milk supply and was anxious to nurse her baby, the cracked nipples stood in the way of successful breast-feeding. It seems an irony of fate that this trouble is particularly common among the well-to-do classes. It may be that the old-fashioned advice of hardening the nipples with rectified spirit, is responsible for this, or that the mothers think that the care of the nipples is such a trivial matter that can be ignored. It is only when lactation begins that they see the truth of the advice when they begin to suffer from breast troubles and the infant from frequent gastro-intestinal upsets as a result of introduction of artificial foods. Lanoline application is usually recommended for the nipples and probably any oily substance like ghee or olive oil may serve equally well.

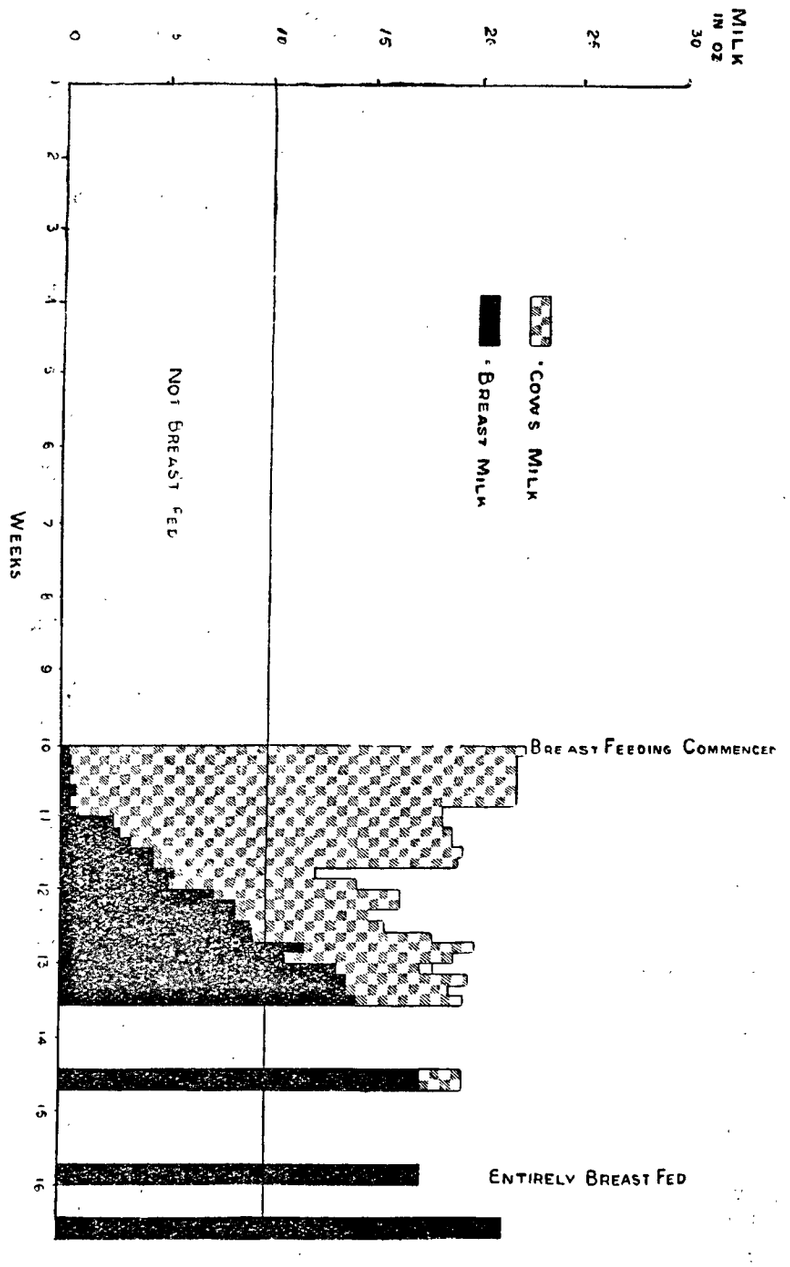
To maintain the supply of breast milk, the following measures may be employed :—

(1) The mother should take a generous amount of fluids; there should not be irksome restrictions. She should be allowed to take the diet she is accustomed to. Expensive articles of diet are unnecessary.

(2) Feeding should be carried out at regular intervals. Three hourly intervals are usually sufficient.

(3) If the breast milk is insufficient, steps should be encouraged to increase the amount of milk. These measures lead to more successful results than rushing towards substitution of artificial foods. The measures for increasing the supply of breast milk are simple but are not known sufficiently well. They are :—

(*a*) Alternate fomentation to the breast with hot and cold water. Two basins are taken, one containing hot water—as hot as could be comfortably borne,



and the other containing cold water. With a large sponge or a bath towel, the breasts are fomented alternately with hot and cold water for 10 to 15 minutes. The breasts are dried and gently massaged.

(*b*) This massage tends to increase the milk supply. At first it is done circular around the breasts, gently kneading them; then they are massaged from the periphery towards the centre. The process must be painless and should cause no discomfort to the patient. Best of all is the stimulus of sucking. The more vigorously the child goes at the breast, the more is the formation of the milk. Hence, where the child is breast-fed at short intervals of 2 hours or less, the interval may be increased to 3 hours or even 4 hours. Breasts may be given alternately instead of simultaneously, so that they are completely emptied. So satisfactory are these simple measures that if a mother carries them out in the first few weeks, she is able to successfully breast-feed the child. Here is a chart showing the effect of feeding in this manner.

Drugs are not usually efficacious. The so-called galactogogues are not of much use. Cotton seed extracts have been found useful in a certain number of cases.

The mother must be willing to nurse the baby. She must be convinced of the necessity of breast-feeding the baby and encouraged to do so because reluctance on her part will more often give disappointing results.

In a few cases, however, mother's milk begins to disagree with the baby, with the result, that it gets watery greenish stools. The baby's general condition seems good, and the breast-milk, which hitherto had agreed with the baby, seems to disagree. Usually, there has been no alteration in the mother's diet or habits. The motions contain curdled milk. These cases are due to the milk being too rich for the baby, for reasons which cannot always be satisfactorily explained. In such cases, the tendency to withhold breast milk is great. This is not necessary and may even be harmful. Simple dilution of breast milk preferably with a little sodium citrate with each feed, gives good results. Sodium citrate is usually used with cow's milk. It can also be used in

these cases and its constipating effect serves a useful purpose. Thus, the mother is instructed to give the baby a grain of sodium citrate in ½ to 1 ounce of water at feeding time and immediately afterwards the baby is put to the breast. The result of this simple measure has been very satisfactory.

There are occasions where breast-feeding has to be withheld usually in the interest of the mother. This is a measure not conducive to the health of the child and there must be clear-cut indications to withhold breast milk. These are:

(1) *General Causes*:

(*a*) Acute fevers;

(*b*) Debilitating condition of the mother like anaemia, cardiac disease, renal disease or chronic dysentery;

(*c*) Tubercle:

(*d*) Insanity.

(2) *Pregnancy.*

Tubercle is a contra-indication both in the interest of the mother and the child. If the mother is pregnant and suckles her infant, it is bad to her state of pregnancy. Insanity is harmful to mother and dangerous to the infant. Syphilis in the mother is not a contra-indication to breast feeding, unless it is the rare case of syphilis cantracted in the last month of pregnancy or afterwards where the infant has escaped the infection.

Local Conditions of the breasts, like retraction of nipples, ulcers, inflammation of the breasts and malignant disease, may contra-indicate breast-feeding.

In cases were breast-feeding should not be carried out or in cases where it fails, some other substitute must be considered. Wet nursing is the next best to mother's milk because the nature of the food is the same. For premature infants, it is probably very necessary during the first few weeks of its life. Any infectious disease or syphilis should be eliminated in the wet nurse. In actual practice, the cost and difficulty of keeping a wet nurse are so numerous that recourse must be had to feeding the infant on cow's milk or some other food.

Artificial Feeding of Infants

Cow's milk is the usual substitute for human milk. The "Cow may be called the foster mother of mankind." In composition it differs from human milk. This difference is not only in the

proteins and fats and carbohydrates, but also, in its ferments, antibodies and vitamins. The following table gives the composition of human milk and cow's milk :—

CONSTITUENTS.	WOMAN'S MILK.	COW'S MILK.
	Per cent.	Per cent.
Fat ...	3.50	3.50
Sugar ...	7.50	4.75
Protein ...	1.25	3.50
Salts ...	0.20	0.75
Water ...	87.55	87.50
	100.00	100.00

Cow's milk is usually modified to resemble human milk before it is prescribed. It was believed for years that the higher percentage of proteins in cow's milk made it disagree with the infant. Modern investigations, however, show that the fats in the cow's milk are more likely to disagree than the other constituents. There are many formulae to modify cow's milk to resemble human milk, but this is the simplest: Dilute one part of cow's milk to 1 to 2 parts of water and add a teaspoonful of sugar to 2½ ounces of milk mixture.

This gives a percentage composition of :—

1.5 %—1 % protein,
7 %—6 % carbohydrates and
2 % fat.

This is nearly the same as in human milk except that the fat is 1% less. Later, fat may be added in the form of cream or in the form of cod liver oil emulsion. Dilution of milk, in more than the proportion of 1 part of milk to 2 of water, is not usually necessary. In the first few weeks, one part of milk may be used with two parts of water. In a week or two, the proportion of milk may be increased to 2 : 3, and in infants of 3 months and above, equal

parts of milk and water may be used. For infants above 6 months, milk 2 parts, to water 1 part. To sum up ;

AGE OF INFANT	MILK.	WATER.
1 week to 2 weeks	1	2
2 weeks to 3 months	2	3
3 months to 6 months	1	1
6 months to 9 months	2	1

Change from one concentration to another should not be abrupt but gradual. The sugar proportion is nearly constant throughout, being a teaspoonful to a 2½ oz. milk mixture. Sugar tends to cause diarrhoea and sour, acid stools ; hence if the bowels are relaxed, the sugar must be reduced. To begin with, sugar may be added in the proportion of ¼ to ½ teaspoonful to a 2½ ozs. feed and then gradually increased in a week or so to the proper proportion mentioned above.

The kind of sugar matters little. Milk sugar, cane sugar, dextrose can be used. Dextrimaltose is the best and is tolerated better. Fat is not so well borne here as in cold countries and in the first few weeks 2% of fat in milk mixture is quite sufficient. Cod liver oil 5 to 10 drops after a feed, twice a day is sufficient, partly for its fat content, more so for its vitamine content. Orange juice may be given ½ to 1 oz. a day. Good oranges are costly and out of season in a number of places in our Presidency. Orange juice is not essential especially where fresh cow's milk is used ; scurvy is very rare here and a little potato cream added to the food from the third month onwards will effectively prevent scurvy. This is prepared by baking a potato in its skin, then peeling it off and scraping the outer portion of the potato with a spoon. This has anti-scorbutic properties. A little of this dissolved in milk and given to the infant, will prevent scurvy.

An important point to be attended to in artificial feeding is that the food must be within the digestive capacity of the infant: in other words, it must be a little bit weak, rather than strong. If equal parts of milk and water are suitable for an infant 3 months old, to begin with, more water than milk should be used, either 2 of milk to 3 of water, or 1 of milk to 2 of water. Then slowly increase the proportion of milk in a week or 10 days, so that the infant gets the right proportion desired. This will prevent digestive disturbances; because if once disturbance takes place, child will not tolerate the milk mixture it could take in health and therefore

weaker milk mixtures are necessary. The result is, the infant loses weight and artificial feeding appears to be a failure. Therefore, try to avoid a digestive upset at all costs by beginning with a weaker fluid and bringing it up gradually to the right proportion.

The other important fact to be remembered is that each infant requires special variation in food to suit it. Infants are not standardised babies and there is no hard and fast rule of infant-feeding which can be applied readily to all. Each case must be given individual attention. Its weight, the state of its nutrition, its freedom from infection or otherwise, its appetite and digestion, the state of its bowels, its activity-must all be studied with care and then the suitable diet prescribed. The response of the infant to the diet must be studied. The indications of successful feeding are a well-contented baby, regularly increasing in weight and active and playful. Indications of unsuccessful feeding are: colic after food, vomiting, constipation or diarrhoea and inability to gain weight or actual decrease in weight.

In the foregone pages, a brief resume of the principles of breast-feeding and artificial feeding is given. There are certain details which have not been included which are nevertheless necessary to be mentioned.

Cow's milk is likely to be contaminated with bacteria when it is drawn off the cow, when it is warmed or boiled in the kitchen, when it is transferred to the feeding bottle, or when it flows through the test. Scrupulous attention to details is necessary and strict attention to cleanliness should be paid to ensure the purity of the milk; patience and tact are required when feeding the infant. The baby must be comfortably held and the milk should flow slowly for the baby to swallow and retain. The milk may be in the right proportion, but haste, carelessness or indifference on the part of the nurse will make the child gulp the milk in haste which it will probably reject soon after.

Lastly, an attitude of sympathy and love towards infants is very necessary. They react favourably to kindness whereas they scream with terror at rough and harsh manners. It is often forgotten that the infant has a nervous system of its own. Cold calculations, exact laboratory methods, will not give such pleasing results as simple ordinary measures blended with a touch of human kindness.

I am much indebted to Lt. Col. C. M. Plumptre, I.M.S., Superintendent, Government Hospital for Women and Children, Madras, for permission to make use of the records of the Children's Department.

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ACUTE DIARRHŒA AND VOMITING IN CHILDREN COMPLICATIONS AND TREATMENT

BY

RAI SAHIB AMBALAL M. MAHADEVIA,

Chief Medical Officer, Jaora State, C.I.

DIARRHŒA and Vomiting is the most serious manifestation of the Catarrhal Syndrome. It is misconception to regard "D and V" as an infective disease attacking only in the late summer months. Cases are quite common in winter and spring especially in damp, foggy weather and during outbreaks of Influenza in the adult population. An ætiological relationship with Influenza is suggested but apparantly negatived by the fact, that infants of better fed classes are spared. In Influenza cases the first symptom is cough with diarrhœa, and vomiting coming on about two days later. Examination reveals a catarrhal throat without membranous exudate and there may be in addition signs of bronchitis. The clinical course strongly suggests that in these cases swallowed sputum leads to infective gastritis. This results in Achlorhydria rapid emptying of the stomach and fermentative diarrhœa. The actual infective organism may be the Streptococcus.

The mechanism of infection in all non-specific cases is probably similar. Low gastric acidity, avitaminosis and anæmia combine to facilitate infection of the stomach. There is a definite group of cases in which vomiting and diarrhœa follow some gross dietetic error ; the symptoms appear to arise from irritation by food. It may be inferred that indigestible food irritates the gastric mucosa

and facilitates infection by organisms which may be derived from the Nasopharynx or conveyed from the infant's fingers. There appears, indeed, to be no essential difference between cases arising from primary gastro-intestinal infection by contaminated milk etc.

In the present state of our knowledge, exact classification of cases is not possible, but a rough classical grouping might be made as follows :—

Group 1. Irritation in origin :—Arising from faulty feeding. Irritation of the gastric mucosa by indigested food may precede infective gastritis.

Group 2. Cases of primary gastro-intestinal infection. The vehicle of infection is contaminated milk, dirty teat, or ' Comfortor', dirt on the infant's fingers etc. The group will include the cases of epidemic enteritis known as "Summer Diarrhœa."

Group 3. Cases of diarrhœa and vomiting due to a secondary infection of the gastro-intestinal tract. In this group the primary infection is in the throat or bronchial tree; sputum is swallowed by the infant and this sets up an infective gastritis from which diarrhœa arises. It may be that in some cases the infection of the gastric mucosa spreads to involve the small intestine. This conception of direct infection of the gastric mucosa resulting in diarrhœa and vomiting is held to explain the onset of internal symptoms in cases of Bronchitis, Tonsillitis and early otitismedia when toxaemia is clinically inconspicuous.

Group 4. Symptomatic or toxic-Toxic vomiting is a common symptom of many acute infections in infants. Diarrhœa may co-exist. Thus diarrhœa and vomiting may be the only obvious symptom in acute Pyelitis and mask the diagnosis if the urine is not examined. Broncho-pneumonia and acute mastoid inflammation are often complicated by symptoms of gastro-enteritis. The latter may arise as suggested above, by direct infection from swallowed sputum. Even if this be so, toxaemia will aggravate the condition.

Group 5. Specific infective group:—Due to dysentery bacilli, organisms of the Coli-Typhoid group etc,

Clinical Features

The clinical features associated with an acute attack of diarrhœa and vomiting vary with the age of the child and the severity of the attack. In infancy a mild attack may be associated with slight fever for a day or so, and very little else may be present besides the two characteristic symptoms of the malady. In cases of dysenteric origin, the mildness of the symptoms may quite mask the possibility of the serious, infectious nature of the complaint, and all cases with blood and mucus in the stools should be regarded with suspicion. The severe forms of the disease in infancy present a characteristic picture which is not easily forgotten. The onset is usually dramatically abrupt; and within a very short time, the baby is obviously wasted with a scaphoid abdomen, hollow eyes, depressed fontanelle, and inelastic skin. Fever is usually present at the onset, but as the general condition of the child becomes worse, the external temperature may fall, while that in the rectum remains high and rises. As the condition progresses, signs of meningism with restlessness, a feeble whim, and head retraction develop. The eyes do not close properly but remain half open with accumulated secretion about them, the pulse becomes rapid and feeble, anuria develops and a curious "Air Hunger" type of respiration may appear. Many cases in an epidemic die early in the attack with the rapid appearance of the above conditions, while others run their severe course, quite uninfluenced by treatment, rather like a case of Typhoid fever. It is obvious that one is dealing with a severe metabolic disorder with great disturbance of the water binding power of the tissues. The loss of fluid by vomiting and diarrhœa, is the dominant feature of the case. Dysenteric cases may be mild with slight fever, abdominal pain, vomiting and frequent passage of blood and mucus, often without fæcal matter, in the stools. In young infants under six months, a severe toxaemic type of dysentery occurs, in which sudden collapse is followed by the passage of six to eight typical motions and a rapid fatal ending ensues.

In older children there is less systemic disturbance. The familiar picture of griping, abdominal pain, vomiting, diarrhœa and a furred tongue, with slight fever, following some food indiscretion, needs no description. The dysenteric group of cases, may, again show little systemic disturbance, but the presence of tenesmus with blood and mucus in the stools is characteristic and should lead to full investigation.

Management of the Case

General considerations:—Except in some cases in group 1 infantile diarrhœa and vomiting once established, shows no tendency to spontaneous remission. Loss of fluid from repeated vomiting and purging leaves the infant in a state of dehydration. The fluid constituent of the blood is depleted, the blood pressure falls, and, in fatal cases, the infant dies, from circulatory failure. Therefore the fundamental aim in treatment must be to restore the volume of the blood and tissue fluid by the administration of large quantities of saline solution by methods, which will be described. At the same time steps are taken to arrest the vomiting and control the diarrhœa. Any scheme of treatment must naturally include an attempt to overcome the internal infection, prevent reinfection of the infant; and prevent spread of infection to other infants.

Infectivity:—Every case of infantile diarrhœa is infective. A case regarded as due to irritation by food is just as likely to give rise to infection of other infants in a hospital ward as is a case of "Summer Diarrhœa". Spread of infection is by contagion. A careless nurse may convey the infection to every infant in the ward. Flies must be regarded as potential carriers of infection from one infant to another.

Nursing:—A baby with diarrhœa should be isolated and for the first 24 hours of treatment should have a nurse who gives it her undivided attention. If isolation is impossible the case can be "Barrier Nursed" in the ward, "Typhoid precautions" being observed. The prevention of spread of infection should be a point of honour among nurses like the prevention of bed sores in old bed-ridden subjects. The infant must be kept scrupulously clean, napkins being changed as soon as they are soiled. Disinfection and cleansing of these napkins should be carried out in a special room set aside for the purpose. The affected baby's feeding bottle must not be brought into the kitchen, when the ward feeds are prepared. Every detail of complete isolation must be considered. Heavy clothing is undesirable; the infant should be kept warm by hot bottles. The room should be well ventilated, the air warm and dry. Flies are to be excluded by draping fine netting over the cot.

Auto-reinfection:—The possibility of auto-reinfection must be considered. To prevent fingers contaminated with fæces being conveyed to the mouth light card wood splints should be applied around the elbows. These are effective and cause no hardship to any infant.

Details of Treatment

In every case food is withheld for atleast six hours. The length of starvation period cannot be decided when the case first comes under treatment; but some idea is given by the degree of dehydration. When the symptoms have been very severe it is unlikely that the infant will be in a fit state to assimilate nourishment after six hours' starvation. On the other hand mild cases frequently do not require to be starved, for longer than this. It is a convenient practice to impose on all cases a trial period of six hours' starvation. At the end of this time a decision must be made as to whether or not feeding may be begun. The best guide is the condition of the stools. If these are still liquid, it is folly to feed the child; further starvation is necessary. Only when the diarrhœa is controlled may feeding be safely commenced, but very few infants require to be deprived of food for more than twelve hours. Sometimes an infant is so weak and shocked from repeated purging that the physician may fear to starve it; but in such cases of doubt it is well to remember that the infants stand starvation much better than dehydration. Liquid stools contraindicate feeding. Throughout the whole of starvation period the infant is given that which it needs more than nutriment-namely fluid. The fluid is administered in saline in half, or full strength or boiled water. The method of administration will be subsequently described.

Lavage

Gastric lavage should be the first step in active treatment and in infants it presents no difficulty. A suitable tube is No. 18 Jacques's œsophageal tube. Failing this the largest available red rubber catheter can be used, but it is less satisfactory, since it does not completely fill the œsophagus and during lavage the infant tends to vomit past the tube. Warm sterile water (with or without Sodium Bicarbonate-a teaspoonful to a pint) or saline can be used. Usually the infant's stomach is empty, but the washing may contain mucus or curds. Lavage should be continued until washings return as clear as the entering fluid. This generally entails the use of a good deal of fluid. Washing out the stomach has a remarkable effect in stopping the vomiting. After lavage the infant can retain water given by mouth. If lavage is not performed even water is vomited.

Colon Lavage.—Attention is now directed to the large bowel which is washed out by means of a soft rubber catheter connected with a funnel or douche can. The infant's hips should be raised and the pressure of the entering fluid low—the funnel not being higher that 2 feet above hips. Colon lavage should be repeated twice in the first 24 hours.

Treatment of dehydration; fluid replacement:—

(*a*) After gastric lavage water is given by the mouth. Unless the infant is sleeping it should be offered sterile water every half hour, from the feeding bottle or from a spoon if too weak to suck. The quantity given is as much as the infant can be induced to take. Water given by mouth is of greatest value, but a dehydrated infant is in immediate need of more fluid than it can drink.—Additional means of supplying the fluid must be resorted to.

(*b*) Subcutaneous salines are commonly employed, but as only a limited amount of fluid can be forced into the subcutaneous tissues, at any rate, multiple needle—punctures are necessary. Thick needles are generally employed and treament is painful.

(*c*) Intraperitoneal saline:—The peritoneal cavity is a convenient reservoir of great absorptive capacity. Large quantities of fluid can be injected quickly, and absorption is rapid. There is no danger in giving intraperitoneal salines provided abdominal distention is absent. The presence of a distended bladder must also be excluded. Requirements for the operation: (1) 10 oz. half strength saline at 110°F in sterile enamelled jug. This stands in a basin of hot water in order to prevent cooling. (2) 10 or 20 c. cm. Syringe, Hypodermic syringe and sharp hypodermic needle. (3) Sterile 1 p.c. Novocain solution (Novutox is a suitable preparation). (4) Sterile towels; Iodine, guaze or cotton wool swabs.

The operation is carried out in front of a good fire—the infant being placed on a locker covered with several layers of folded blanket. The abdomen is exposed and the clothes are kept clear of the operation area by means of a suitably applied sterile towel. Another sterile towel is tucked in over the napkin and folded

round the infant's legs. At this point the baby is given a feeding bottle containing sterile water. The bottle is held by a nurse, who watches the child's arms, and if necessary, gently prevents their contact with the abdomen.

A convenient site for injection is about 1 inch below and to the right of the umbilicus. After painting the abdomen with Iodine an intradermal injection of Novutox is given, which precedes the steady infiltration of the subcutaneous tissues, down to the parietal peritoneum. When the hypodermic needle is felt to pass into the peritoneal cavity the small syringe is detached, leaving the hypodermic needle in situ. To this needle the 10 or 20 c. cm. Syringe filled with half strength saline, is attached, and the contents are injected into the peritoneal cavity. Thereafter the syringe is detached and refilled and the injection is repeated. This is done again and again until the desired quantity of fluid has been instilled. An average small infant of about six months generally takes about 7 or 8 oz. The hypodermic syringe is then withdrawn. The minute puncture does not require sealing, but flexible collodion may be applied if one chooses.

From start to finish this little operation does not take more than 20 minutes, carried as described, it has certain advantages *viz.*:—

(1) Simplicity:—No special curved needle or other apparatus not universally available is required. The infant's attention is devoted to the feeding bottle. There is no crying.

(2) Painlessness and absence of shock.

(3) A relatively large amount of fluid is instilled within a short time. Absorption is rapid. In most cases, before the operation is complete, an improvement in the infant's condition is obvious.

The amount of interperitoneal saline to be instilled depends to some extent, upon the size of the child and upon the degree of dehydration, but the peritoneal cavity must never be distended with saline. To do so would hamper the respiratory movements and incur the risk of circulatory failure, or Hypostatic Pneumonia. A rough idea of the quantity of saline in ounces which can safely be given may be arrived at by adding one to the age of the child in months, *e.g.*, an infant of 6 months is likely to accommodate 7 oz. without embarrassment of the diaphragm. The intraperitoneal

infusion may be repeated at any time if the infant's condition called for it.

Medicinal treatment.—In comparison with the importance of the general Hygiene, the prompt treatment of any collapse, the correction of the diet and possibly lavage of the stomach and colon, the use of drugs must take a second place. Collapse must be treated by warmth applied either by hot water bottles, an electric cradle, or hot wet packs. Saline infusions are naturally also indicated and stimulants may be required as well. Of these Alcohol is one of the most valuable; from 20 to 60 drops of Brandy may be given in a little water every two to three hours. Camphor may be administered by subcutaneous or intramuscular injection, using 5 to 10 minims of a 10 p.c. solution of Camphor in Aether and Olive Oil. A small dose of Pituitrin $\frac{1}{4}$ of a c. c. may also be given. A hot mustard bath is often valuable in the treatment of collapse. 1 ounce of mustard should be used to each gallon of water and the child held in the bath till the skin of the nurse's arms is tingling.

With the exception of the preliminary purge it is advisable to check the diarrhœa too energetically in the early stage. The vomiting generally ceases after a stomach lavage; if it is very persistent sips of cold or iced water or iced brandy and water may be useful; occasionally a tiny dose (1 grain) of Chloretone may be effective. If vomiting is persistent Calomel in fractional doses may be used instead; $\frac{1}{6}$ grain of Calomel can be administered every hour upto 6 doses. For the diarrhœa repeated small doses of Castor Oil are often valuable, especially in less severe forms of the disease. It may be given with mucilage as follows:—

℞

Oil Ricini	...	♏ v
Mucilage Acacia	...	gr. xv
Syrup	...	♏ xxx
Aqua Mentha Piperitta ad	...	℥ i

One drachm three times a day.

A mixture of Grey Powder, Sodium Bicarbonate and Bismuth is generally of service *e.g.*

℞

Hydrargyri Cum Creta	...	gr. $\frac{1}{4}$—$\frac{1}{2}$
Sodium Bicarbonate	...	gr. $\frac{1}{2}$—1
Bismuth Carbonate	...	gr. 2—4

One powder every 4 hours.

or one containing Bismuth, Calomel and Dover's Powder in small doses may be given *e.g.*

℞

Bismuth Carbonate	...	gr. 5
Pulv. Ipecacuanhœa Co.	...	gr. $\frac{1}{6}$—$\frac{1}{4}$
Calomel	...	gr. $\frac{1}{8}$—$\frac{1}{4}$

when the large bowel is mainly involved, as in the dysenteric form large doses of Bismuth are sometimes well borne, say, 10 grains of Bismuth Carbonate.

Opium is valuable, when the acute stage of dehydration is over and there are repeated loose motions associated with a clean tongue. Under six months of age the dosage of the Tincture of Opium is about a $\frac{1}{4}$ or $\frac{1}{2}$ minim and after that age should be gradually increased upto 1 minim at a year old (*i.e.*, the dose in minim roughly corresponds to the age in years). The restless baby should be given sufficient Chloral to insure quiet (grain $\frac{1}{2}$ in water four hourly for a baby of six months).

In severe diarrhœa one remedy is of value, namely, Kaolin. This is a fine greyish white powder, insoluble, but readily mixable with water to form a fine suspension. Kaolin is stated to have the property of absorbing toxins; at all events, by coating the bowels it favours constipation. The value of this remedy in diarrhœa is well established, but large amounts must be given in severe infantile diarrhœa. Kaolin can be given by the mouth, but as in the case of water given by the mouth the infant can seldom take as much as it needs. This difficulty can be overcome as follows:—

> $\frac{1}{2}$ to 1 oz. of Kaolin (Crook's Collosal) preparation is mixed with about 2 oz. of hot water. Before withdrawing the œsophagus tube after gastric lavage (the first step in treatment) this suspension of Kaolin is delivered into the stomach. In some cases within a few hours a formal clay coloured stool is passed which consists almost entirely of Kaolin. This indicates that the diarrhœa is being brought under control.

After the first large dose of Kaolin given as described small doses are offered to the infant in a teaspoonful at frequent intervals. Some babies take Kaolin well. Some dislike it. If the stools remain liquid after a few hours and if the infant is unable to take sufficient Kaolin by the mouth, the œsophagus tube is again passed and a second large dose is delivered into the stomach.

Feeding

Feeding is commenced only when the diarrhœa has been brought under control. This may take six to twelve hours. During the starvation period the infant has been drinking as much sterile water as it is willing to take, in addition to having received saline intraperitoneally. For feeding, Dilute Lactic Acid Skimmed milk is chosen. (Lacidac is a convenient preparation).

The easiest way to make skimmed milk is to take a small enamel douche can, insert cork in the tube outlet, and simmer therein fresh milk for half an hour, then remove and place on ice for 2 hours. The fat of the milk will by then have all risen to the top, and the lower two thirds in the vessel can then be obtained by removing the cork from the outlet and letting the milk run into a clean jug. This milk is to all intents fat-free, and should be given diluted 1 in 3 to start with, gradually increasing its strength.

It must also be remembered that gastric acidity is usually definitely lowered, and that the choice of artificial food is therefore limited to a skimmed dried milk with the addition of Dextri-maltose or to Lactic Acid skimmed milk ; this is made by taking one pint of boiled skimmed milk and half a pint of boiled water and adding 60 minims of B. P. Lactic Acid, drop by drop stirring well ; it must not be heated above body temperature, or it will curdle. Sugar in the form of Dextri-maltose can be added as required.

For the first 48 hours the infant is fed every two hours-12 feeds in each 24 hours. To begin with, the size of the feed should not exceed ½ oz. and increase should be very gradual, about two drachms at a time. Dextri Maltose gr. 10 may be added to each feed for the first 48 hours, and this amount may be gradually increased. By the beginning of the fourth day the interval between feeds can be increased to three hours. The amount of the feed is then about 2 oz. with added Dextri Maltose grs. 30, eight feeds being given in 24 hours. After 4 days if there is no tendency to relapse and the infant is hungry, the feeds are again increased in bulk and Caloric value. The temptation to increase the size of the feeds quickly must be resisted. To do so is simply to invite relapse. In most cases after ten days a half cream dried milk (half cream Glaxo and Dryco) may be substituted for the dilute lactic acid milk. Milk of full fat content should not be given for some time, for fat is badly borne,

At the third day one drop of Adexolin (Vitamins A and D in concentrated solutions) is added to each milk feed. There is generally marked secondary Anæmia in these infants and small doses of syrup Ferri Phosphate Co. or Ferri et Ammon Citras gr. 3 to 5 may be given three times a day, from about the tenth day.

In all cases there is danger of relapse. Any recrudescence of symptoms calls for immediate deprivation of food, gastric and colon washes and administration of fluid and Kaolin. Perhaps the commonest cause of relapse is increasing the size of the feeds too quickly. Other frequent causes are cold, damp, foggy weather and re-infection from some source. The infant must be guarded against cold by hot bottles and a flannel abdominal binder.

Hyperpyrexia is a grave symptom and frequently ushers in convulsions. Cold packs or a cold bath, iced cold Enema may have to be given and repeated. Sometimes one grain doses each of Dover's Powder and Aspirin saved some cases.

Rectal tenesmus is often the cause of shock and continual whining. I would advise you to apply round the anus a mixture of equal parts of Zinc Oxide and Castor Oil and then place hot bread or linseed poultices over anus.

Convulsions frequently initiate and sometimes terminate acute diarrhœa. In the early stage a warm bath and a preliminary dose of castor oil are useful, but convulsions in the late stage rarely react to any treatment, although of course, treatment with Chloroform Chloral or Dover's Powder may tide the child over the danger period provided the other lines of treatment are being carried out.

BOWEL DISORDERS IN CHILDREN-(SOME ASPECTS OF)

BY

NISA NATH GHOSH, M.B., (CAL.),

Teacher of Medicine etc., B. W. Medical School Dibrugarh—Assam.

BOWEL disorders often present tricky problems to medical men. If it is true of grown up patients it is much more so in the case of infants and children.

In the diagnosis and consequently in the treatment of bowel disorders of children one has got to remember the following facts peculiar to such little patients only :—

A few peculiarities

(1) Overfeeding, bad food, irregular feeds, worms and

dysenteric infections are at the root of many bowel disorders in children especially in India.

(2) Epidemic diarrhœa or summer diarrhœa of infants and children is common. Cyclic vomiting and peritoneal tuberculosis with bowel disorders are not rare. Coeliac disease though rare is worth remembering.

(3) Gastroduodenal ulcers, gallstones, hepatic diseases in general are rare in childhood.

(4) Common hepatic disorders in children are:—Jaundice of the new born and catarrhal jaundice. Infantile cirrhosis of the Liver is a definite entity, pretty common in some big towns of India *e.g.*, Calcutta, Madras, Dibrugarh etc.

(5) Generally speaking signs and symptoms of dyspepsia in childhood are more often intestinal than gastric and they are ill-defined—not so well defined as in adults.

(6) Effects of bowel disorders on general health are more profoundly and quickly marked in children than in adults.

(7) Two rectal troubles are common in children viz- prolapse rectum and polypus. The former often accompanies lower bowel troubles in children. The latter may produce stools simulating colitis or dysentery.

(8) Of surgical bowel troubles—intussusception is pretty common. When it protrudes through anus it may resemble prolapsed rectum in appearance. Other varieties of acute intestinal obstruction, hypertrophic stenosis of the pylorus, idiopathic dilatation of the colon, and appendicitis, though comparatively rare are possibilities worth remembering. Henoch's purpura is a rare cause of confusion. It may produce symptoms of acute abdomen.

Chief Manifestations

Bowel disorders in children often show one or more of the following troubles:—Vomiting, Diarrhœa and Constipation. Of these constipation, unless it is due to intestinal obstruction is not so urgent a problem as vomiting or diarrhœa.

Pain is a variable factor. Often it is colicy and ill-defined and—if the child is big enough—located usually around the navel.

Let us go a little more into the details of the 3 chief manifestations of bowel disorders of children *viz.*, vomiting, diarrhœa and constipation—one after another :—

Vomiting

All cases of vomiting can be grouped as under into 3 groups :—

(1) Those not due to gastrointestinal diseases.

(2) Those due to surgical diseases.

(3) Those due to other causes not mentioned above.

1. Those not due to gastrointestinal diseases :—Examples of such vomiting are :—

(*a*) Cerebral vomiting—in meningitis, cerebral tumour or abscess and all conditions of cerebral irritation and increased intracranial pressure.

(*b*) Vomiting due to overfeeding of infants. It is usually harmless.

(*c*) Vomiting due to pharyngeal irritation as in some cases of adenoids, in some infants used to finger sucking etc.

(*d*) Vomiting due to retching or straining as is seen during violent coughing fits of whooping cough.

(*e*) That accompanying infections—especially febrile infections.

(*f*) Vomiting due to drugs *e.g.*, ipecac etc.

In all such cases mentioned above, treatment is directed to the cause besides symptomatic measures.

2. Those due to surgical diseases:—*e.g.*, intussusception, volvulus, pyloric stenosis, appendicitis etc., cause violent vomiting. Medicinal measures are of little help in such cases.

3. Vomiting due to other causes not mentioned above :—*e.g.*, gastritis, enteritis, cyclical vomiting, acidosis, hepatic disorders etc. Treatment of this group has been briefly noted below along with diarrhœa.

Diarrhoea

Diarrhœa in children like vomiting can also be grouped into 3 as follows :—

(1) Infective Diarrhœa due to enteral infections.

(2) Symptomatic Diarrhœa or diarrhœa due to parenteral infections.

(3) Dietetic Diarrhœa (due to some faults in food or manner of taking food).

In No. (1) and No. (2) noted above infection is the chief cause.

1. Infective Diarrhœa or diarrhœa due to enteral infection (infection of the bowels):—Examples of this type are those cases of diarrhœa which are due to dysenteric and other organisms as Shiga, Flexner etc. The summer diarrhœa of infants and children belong to this group. Infection along with atmospheric conditions *e.g.*, heat, moisture etc., precipitate an attack-particularly in India. Epidemic outbreaks may occur. The onset is sudden with fever and vomiting. Blood and mucous are not rare in stools. But their absence does not necessarily negativate dysenteric infections.

2. Symptomatic Diarrhœa or diarrhœa due to parenteral infections *i.e.*, infection in other parts of the body than the intestines. For example, otitis media, pyelitis, mastoiditis etc., may cause diarrhœa. In such cases symptoms of the original trouble are often self evident though sometimes they may require careful searching. Treatment of the root cause together with symptomatic remedies are called for. (For the latter-see below).

3. Dietetic Diarrhœa:—This may be due to —

Protein indigestion ;

Fat indigestion ;

Carbo hydrate indigestion ;

General-over feeding or irregular feed or indigestible feed.

The last one is the commonest cause. Diarrhœas of dentition often come under this group.

Protein indigestion in little children gives rise to alkaline offensive stools with bean like curds. The colour of the stools is neither white nor bright yellow.

Fat indigestion:—Produces highly acid stools of sour odour, excoriating the buttocks and showing white fat curds. Unlike protein curds these fat curds are dissolved in ether and tend to float on water. Slight fever, vomiting, and acetone in urine are frequently found in this type of indigestion.

Carbo-hydrate indigestion—shows frothy acid stools scalding the buttocks and containing all food elements. The tolerence of infants to carbohydrates is rather high. So, in carbodydrate dyspepsia there is not simply an excess of carbohydrates in the food

but also of proteins and fats. So, there is indigestion of all 3, proteins, fats and carbohydrates—more or less.

General over feeding is the commonest and most important cause of dietetic diarrhoea. Over-feeding may occur without increment of actual quantity of food. The same diet which is tolerated by a child in winter may set up diarrhoea in summer. As a rule, food requirement in infants and children is less in summer than in winter.

On the other hand need for drinks of plain water between feeds is greater in summer than winter. Properly fed children can overcome mild infections which overfed ones with overtaxed digestive and excretory organs cannot. Thus in many cases of diarrhoea the predisposing cause is dietetic error and the exciting cause is enteral infection.

Onset of dietetic diarrhoea is slow and insidious. Apparently it may be quite sudden but careful scrutiny will always reveal a period of failing health, decrease in weight and unhealthy stools at the very beginning ; after which frank diarrhoea sets in.

In all cases of diarrhoea, especially if severe and particularly in children, whether due to enteral infection or parenteral infection or to dietetic causes the great dangers are :

Dehydration ;

Acidosis (or Alkalosis in a few cases) ;

Toxaemia.

Dehydration is indicated by pinched nose, parched lips, hollow eyes, dry tongue, dry rough skin or goose skin, depressed fontanelles (in infants) husky voice, sunken abdomen, scanty urine and thirst etc.

Acidosis results from dehydration, starvation, fever etc. It is indicated by recurrent vomiting, rapid respiration, acetone in urine and breath ; air hunger and cerebral symptoms in bad cases.

Alkalosis may occur in some cases if persistent vomiting and consequent loss of hydrochloric acid continue for sometime.

Toxaemia is well marked in diarrhoea due to enteral and parenteral infection and varies according to the degree of virulence and nature of the infective agents.

In most cases signs and symptoms of toxaemia and acidosis coexist in varying proportions.

In fatal cases—dehydration, toxaemia, acidosis and complications like bronchopneumonia (common), sinus thrombosis etc., often end the scene.

Treatment of Diarrhoea in Children

To begin with all infective cases (especially enteral infections), should be segregated. Rest in bed and warmth to the abdomen are two important preliminaries. Children who are able to walk about should be induced to remain in bed by any and every means. In mild cases, diet regulation with ordinary symptomatic measures suffice. In such cases ever watchful diet control and stool inspection for sometime are important to ensure a complete cure. Otherwise chronic indigestion will set in and ruin the patients' health for ever.

In all cases whether mild or severe, after keeping the patient in bed, all food should be stopped for 6 hours or more if the stools continue to be watery.

In cases due to microbic infection, if there be any specific remedy (*e. g.*, Anti-dysenteric serum for bacillary dysenteric infection) it should be administered at once.

In cases of helminthic infections necessary treatment for the worms concerned should be adopted as soon as the acute attack is over.

Except in very mild cases—treatment for dehydration and acidosis should be started at once. Boiled water or normal saline or saline with sodium bicarbonate (gr. 60 to a pint) or 5% Glucose or Lactose water may be given by mouth in small quantities at frequent intervals (every ½ hr.). Lemon juice or pomegrante juice can be added to any one of the above with advantage.

If there is vomiting, fluid by mouth is difficult to retain. A child with vomiting may retain fluid in the stomach after gastric lavage with alkaline saline (as used for drink). A big sized rubber catheter with a small funnel may sometimes serve the purpose of a small stomach tube. In many cases even if there be no vomiting fluid taken by mouth is not sufficient to meet the requirements. So subcutaneous, intravenous or intraperitoneal saline is required in many cases. Subcutaneous saline is painful and some believe that given in axillae it predisposes to pneumonia or broncho-pneumonia.

Intravenous saline is to be given slowly and at body temperature provided the heart is not very weak.

Intraperitoneal saline is often useful. It should be avoided in cases with abdominal distension. Precautions to remember about its administration are :

(1) The bladder must be empty ;

(2) Intraperitoneal saline should not be given in cases with tympanites ;

(3) The peritoneal cavity should never be distended with saline.

(4) The quantity required is found in ounces by adding one to the age of the child in months (*e. g.*, a child of 8 months will require 8+1=9 ounces).

Rectal saline is of little use in cases of diarrhoea. Much of it is expelled. Besides it is very unpopular and inconvenient in many Indian houses.

Drug treatment *is of minor importance*. In many cases the customary preliminary purge is not necessary. If several watery stools have already been passed then obviously little or no undigested food is left in the bowels and dehydration is fast progressing. In such cases purgatives are positively harmful. No purgatives either as castor oil or as sodii sulph or any other saline is advisable. All of them aggravate dehydration especially in cases with watery stools. Castor oil in ♏ v. doses may be used not as a purgative but as an anti-diarrhoeic. It may be given as an emulsion with small doses of tinct Bellodonna and lime water and dill water. Liq. paraffin may be used for its soothing effect on the intestinal mucosa. It may be given with mucilage in ½ dram doses or more as pointed out by Dr. Gunewardene of Colombo. Kaolin is very useful. It is protective to the mucous membrane and absorbs toxin. Its usual dose is ½-1 ounce in warm water to begin with. Later on smaller doses are given. If kaolin is not available, Bismuth carbonate may be used. Opium in any form is better avoided. But in obstinate cases of lienteric type particularly, exhibition of opium or one of its derivatives in carefully regulated small doses is worth trying.

Cases with frequent small or dysenteric stools often have a good night's rest after an enema of :—

Bismuth Carb	...	2 drams
Tinct Opii	...	10 minims
Mucilage of starch	...	4 drams

It should be injected warm and at bed-time with usual care.

As antispasmodics :—Tinct asafœtida; or spirit Etheris Co ; or Benzyl Benzoate 20% solution in alcohol may be used in proper doses. If vomiting be severe and not controlled by gastric lavage, drop doses of Liq adrenalin chloride $\frac{1}{1000}$ or of Liq atropine

sulph in ½ dram of water may be tried. In severe acute cases with collapse, stimulants are called for. Then brandy, Adrenalin, Atropine, Camphor etc., may be used.

Diet—The very first thing to impress upon in an average Indian house is the necessity of :—

(1) cleanliness in preparation and administration of diet
(2) keeping diet articles covered
(3) regularity of feeding.

The following procedure about diet may be adopted :—

1st 6 or 12 hours—No food; drink of glucose or boiled water or saline only to be given as said before.

2nd day—Lime water ... 1 part
Barley water ... 2 parts
Whey ... 2 parts

3rd day—Replace whey by citrated milk or lactic acid milk or butter milk or Lacidac in the diet of 2nd day.

4th day—Every 3rd feed is of malted milk or Peptalac otherwise same as last day.

5th day—If the patient is used to rice-then thin strained rice paste with soup of non-scaly fish or with vegetable soup is allowed once a day. Other feeds are as on the 4th day.

Later on—Ripe bananas, tomato juice etc., are allowed and added to the dietary.

Increase in diet and return to normal diet should be very slow. Relapses are often due to rapid increase in diet. Once relapse occurs we are to begin again with starvation period followed by liquids and so on.

During convalescence, administration of Vitamin A and D as Adexolin, Haliverol etc., and of calcium as calcium gluconate or collosol calcium are very beneficial.

Recently Mignot French reported very good results in diarrhœa of children by using ripe apples. The patient is kept on a diet of fresh ripe apple puree of 500 to 15000 grammes daily for 2 days. No other food is allowed not even sugar along with the apples. Later on other food articles are added very gradually. The active beneficial agent in this treatment is believed to be one or more of the following :

Tannin, pectin, acids or vitamins contained in the apples.

Constipation

3 common causes of constipation in children are :—

(1) Too little water—intake ;
(2) Too bland food or underfeeding ;
(3) Faulty habit.

Necessary corrections of these will cure most of the cases a physician usually comes across.

Very often in infants constipation is due to want of water in between feeds.

In older children, the increase in diet may not be sufficient for the age and growth requirements or the diet may contain too little coarse residue or roughage. Both these end in constipation.

Sometimes the child is not trained up with care to attempt to have at least one movement of the bowel every day.

Treatment of constipation in children :—

In treating constipation in children drugs come last; habit formation comes first ; and dietetic measures in between these two.

All children should be trained from the very early days of their life to get into the habit of trying to secure bowel movements at definite hours every day as a routine measure—whether every attempt is successful or not, it matters little. In the long run it will be successful.

For infants—the following measures are recommended :—

(1) water between milk feeds 3-4 times a day.
(2) Addition of a little honey or extra cream or fresh butter or lactose with 2 or 3 feeds every day.
(3) Use of malted milk.

For older children, we may try :—

(1) A cup of water at bed time and again the 1st thing the next morning.
(2) Milk and fruits—twice daily. Of fruits—dates, raisins, prunes are good. A cup of warm milk with a little honey and a few dates or raisins soaked in it taken at bed time is quite helpful.

If simple measures as mentioned above fail, medicinal measures may be adopted. But every attempt should be made to give up drugs as early as possible by gradually reducing their dosage and paying greater attention to dietetic measures and to regular habit formation.

Drugs which may be tried are:—

Liquid paraffin;
Liquid paraffin with Agar preparation;
Milk of Magnesia;
Cascara;
Syr. Senna;
Taxol etc.

Dosage—Should be proportionate to the age and requirement of the patient. The minimum required to secure a motion should be used for the minimum period of time.

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A FEW GENERAL OBSERVATIONS ON PEDIATRIC PRACTICE

BY

D. R. ANNAMALAI, L.M.S.S.A. (LOND.),

Department of Pathology, Stanley Medical School and Government Rayapuram Hospital, Madras.

IT is, unfortunately, too true that, in India, pediatrics has yet to be recognized as one of the most important branches of medicine. One is inclined to state that pediatrics, as a subject, is not even in its infant stage but is yet to be born. One has only to observe the alarmingly high death rate of infants and children in India, to support this statement. While, in other countries, there are hospitals of hundreds of beds for treating sick children, there has been so far no children's hospital here. The section of pediatrics has, only of late, been included in the medical curriculum in some of the institutions and has yet to be incorporated in the syllabus in others. The only scientific organ on this subject, "The Indian Journal of Pediatrics," is not even an year old. These are all, evidently, strong proofs to show that sufficient attention has not been paid to this vital department of medicine. Such a state

of affairs is all the more deplorable, in a country like ours, where the birth and death rates of children are far in excess of many others and where, in the ancient Hindu systems of medicine, pediatrics was treated as a speciality—even now we come across hakims, generally old women in their sixties or seventies, with a hunch at the back but with a high repute for treating infants and children.

In this paper, it is proposed to point out a few general observations on the examination and treatment of children. Infants will be included under children, unless otherwise stated.

Duration of examination.—Any amount of time spent in a thorough examination of a child is not too much; for children form the bulk of the patients in whom the history of the present illness or even the cardinal symptom is not available to us 'in the patient's own words'. So also are the subjective symptoms. These children are the dumb innocent patients, in whom all our powers of observation sometimes fail to detect the nature of the ailment. But, in spite of this, it is a common occurrence, in our practice, that we dispose of several new children, with a two or three minutes examination. In treating children's ailments, the family physician has a decidedly greater advantage than the rest of the doctors; he knows, or at least, is presumed to know the child's antecedents; and the child also is used to him, so to say. The mechanism in a child is so delicate that the appearance of a new doctor, however mild he may look, upsets it very easily, especially when it is ill; the child is excited, begins to cry, its pulse-rate is accelerated, the respiration is increased, the face is flushed and so on. This is exactly the time, when an examination should not be made, as it is often misleading. But what obtains here in most of the examinations of children is otherwise and I request the readers for making an attempt here to express candidly the nature of some of our examinations, in many of our Indian homes. It is often a rich family that can take a specialist for ordinary ailments of children or it is the other way, that the specialist is called in, when the child is in a very serious state. There is a great commotion in the house, the mother almost weeping incessantly about the dangerous condition of the child and the friends and relatives gathering in large numbers to console the parents, with their boisterous, anxious enquiries. Some of them have assembled in the house to have a view of the distinguished specialist, as the requisitioning of the specialist often spreads like wildfire. The servants of the house are busy arranging the whole

house, specially the room in which the child is kept and other apartments through which the specialist will have to come into the house. The family physician or the practitioner in attendance is expected to arrive with the specialist. When both the doctors arrive, they are led into the house by an elderly gentleman, followed by a band of people. The specialist, who can only spare a few minutes of his precious time, directly commences the examination of the child, which also begins to yell out, as soon as it sees the specialist, scared by his appearance and also by the large bustle in the house. Often, by the time the examination is finished, the child also begins to settle down. I make a special request of the readers that I should not be construed to be disrespectful to the specialist or to the first rate general practitioner, whom we very often mistake for the specialist in our country ; but it is my only fervent submission that we should devote more time in the examination of sick children. I honestly feel that the younger these children are, the greater should be the duration of our examinations. Dr. R. Hutchison, the famous physician of the London Hospital, is also the consultant in the Hospital for sick children, Great Ormond Street, London. His lectures on "Diseases of Children" are as instructive as they are simple and he is surely a busier person than many of us. Yet he bears this aspect in mind and never hurries through his patients in the children's hospital. Those that closely followed him in his ward rounds, are aware that he has shown a method of approach of these patients, which he has probably cultivated for a long time. This is more difficult to acquire than the one, which a veterinary doctor has to practice in tackling an animal. He does not commence an examination of a new patient in the children's hospital straight off ; he sometimes watches the patient from the adjoining cot, before he actually goes near it. His first attempt is to become friendly with the little patient and then he has his quiet examination. It is no exaggeration to state that it pays one well to be extraordinarily patient in the examination of a sick child. If a child is sleeping, it is fortunate for the doctor who is called in. In such a case, the doctor's first instructions could profitably be not to wake up the patient. He can finish his examination thoroughly while the child is in slumber, then arouse it and complete his examination by making such other observations as are to be made while the patient is awake, *e.g.*, the appearance of the facies, the tongue, teeth and the presence of any tenderness &c. The best time for the examination of the chest, palpation of the abdomen and the

eliciting of any reflexes etc., is during sleep. It is even advisable that we send word through the person that goes to fetch us, to allow the child to sleep, or at any rate, not to wake up a sleeping child for the doctor's arrival. It may often be, that in the first visit, the doctor has not been able to become familiar with the patient and complete the examination but that is no reason why he should rush on to a diagnosis, with an incomplete examination. An ideal examination of a child would involve a longer time than that of an adult and also require a calmer attitude of the doctor. The results of any examination made when the child is excited cannot be relied on.

Family history is all-important in a child's ailment. The parents should be specially examined, and any history that could suggest a direct or an indirect relation to the present illness should be carefully gone into. The health of other children, if they are living, and the causes of death in those that have died should be ascertained.

History of previous illness is of special value in diseases of children for two important reasons.

1. There are some children who get an exaggeration of one set of symptoms, before the commencement of any illness. I fully remember the case of a female child in the west end of Madras, who gets an attack of asthma, whenever she gets ill. It actually happened that a doctor, who had to treat the child in my absence, was much worried only about this rapid breathing ; in fact, he concentrated all his attention on this and ascribed the fever and every other symptom to this one cause. The nature of the illness which the child suffered from, was, after all, malaria (Plasmodium falciparum infection, as subsequently shown by the blood examination). A few doses of quinine set the child alright, the rapid breathing also disappeared, side by side, as soon as I took up the case on my returning to the station. I was quite familiar with the asthmatic symptoms in this child and was never perturbed by it. Such cases are common enough and will sometimes bewilder us, if we do not go into the previous history carefully.

2. The previous history also helps us to gauge, to some extent, the so-called diathesis of the child and arrive at a conclusion with regard to the clinical type to which the child belongs, whether of the lymphatic or neuro-arthritic type.

The build of the child.—Here the length, the weight, the size of the head, the nature of the fontanelles (incomplete closure), and

the general development are all factors to be taken into consideration.

Registration of weight.—A good index of the general development of a child is its weight, in relation to its age. The weighing machine is a necessary item in the armamentarium of every doctor and is indispensable in the case of the pediatrician. Many a child may not be able to stand erect on the balance but that is not the only way how the weight should be recorded. The best way of noting the weight is to record the weight of the child's parent, with the child in the parent's arms or shoulders and then find out separately the parent's weight. The difference between these two weights is, surely, the child's weight. This procedure is very simple and does not require any mention here, except to point out that it is not so good in the registration of weights of babies or infants. Once I was told by a postal official that his child was, with great difficulty, arranged to stand on the balance and the weight suddenly taken, in a manner very similar to what a photographer does in tackling children, before the final exposure is given. Any way, the method described above is quite simple and can be followed for all time to come.

An easy formula that helps us to remember the weights of children at different ages is :—

At birth	7 Lbs.
,, 5 months	14 ,,
,, 12 ,,	21 ,,
,, 24 ,,	28 ,,
,, 7 years	49 ,,

In Indian children these are slightly less.

"So, the weight is doubled at 5 months, trebled at 12 months, quadrupled at 2 years, all these weights being multiple of 7 lbs. —Still—

Weights of children should be recorded and always registered by the family physician for future reference. The gradual increase in weight is also useful in watching the progress of a child in marasmus, where the feeding should depend on the " capacity of the patient ".

In infancy, any trivial causes, *e.g.*, constipation, diarrhoea, sleeplessness, minor respiratory troubles, act against the healthy increase in weight.

The Teeth.—Any examination of a child is never complete, without a careful inspection of the teeth, as it gives a fund of information.

First, it helps us to understand any congenital ailment which

the child may be suffering from. Secondly, it enables us to find out whether teething is the actual cause of the present illness; for, we know, from the time of Hippocrates, that any symptom varying from a slight indisposition to hyperpyrexia and convulsions may be produced by teething. Thirdly, it is one of the best criteria from which we can judge any nutritional deficiency in the child.

Increase of saliva, diarrhoea, loss of appetite, bronchitis, irregular fever, certain skin diseases, decrease of weight or failure to gain weight, incessant crying, photophobia, flushing of cheeks and a variety of other symptoms may be produced by teething alone in some cases.

However, it is useful to remember that the second dentition, which generally commences at the age of 6 years, though variable in different cases, does not produce much disturbance in most children. Some children have acquired some habit spasm or suffer from enuresis, and these are wrongly associated with second dentition.

Record of temperature.—This is, no doubt, one of the important clinical data to be recorded in every case and the doctor can never afford to forget it, as the parents of children, in our parts, consider the improvement of the child's condition, only by a decline in the temperature. The heat-regulating mechanism is yet to fully develop in children and the surface temperature is subject to great fluctuations. Hence such temperatures cannot be relied on and the habit of taking the temperature in the axilla or groin cannot be too strongly condemned.

I have had cases in which there had been a sudden increase of 5 degrees or more in the surface temperature in the course of ten minutes, without any paroxysm of fever coming on.

It is the rectal temperature that should be recorded, and relied on in sick children.

If any of the patient's own thermometers is used, it must be verified before use. That the children's temperature should not be taken in the mouth need not be emphasized and the parents themselves would not allow such a procedure. The surface temperatures in children may show sudden fluctuations, even as a result of minor causes, *viz.*, passing of a motion, exposure to a cold wind, a small amount of perspiration, a good sleep etc.

The Blood.—The microscopical examination of the blood in children is none the less important than in adults. In assessing the value of total leucocyte count, it is advisable to remember that, in infants, the count may be 10,000 to 12,000 per c. m m. while, in

children, it is about 10,000 per c. mm. In a differential count, the lymphocytes are decidedly greater than in the adult ; the large lymphocytes, that are not found, as a rule, in adults in large numbers, coming up to more than 10% in children, the total lymphocytes coming up to 40 to 45%. This relative increase of lymphocytes in normal children should not be forgotten, as an ignorance of this fact often leads one to wrongly interpret this normal increase of lymphocytes in children as a lymphocytic leukocytosis suggestive of some chronic disorders.

It is also to be borne in mind, that it is not easy to distinguish between the different varieties of leucocytes, in their early stages, in the blood of children and hence great care must be exercised in reckoning such counts—often with the help of experts, whenever available.

Urine and Motion.—The passing of motion is often properly noticed by the parents and their description of the motion, can, to a great extent, be relied on, provided we do not put any leading questions, specially to ladies who are apt to say, " Yes ", for such questions, in these parts. But, with regard to urine, I have heard in some cases the parents say that no urine was passed in 12 to 18 hours; this has subsequently been found to be wrong, on careful watching. It often happens that the voiding of urine has not been noted by the parent or, a small quantity of urine is passed and gets evaporated before the mother sees the child again. Hence we should not be alarmed at such statements that the child has not passed urine at all; but should definitely know about it, before we begin to act on it. The best time to collect urine in children is when they are awakened from sleep and an application of cold to the lower abdomen often has the desired effect. In male children, urine may be collected with a test tube attached to the penis with adhesive plaster. This should be carefully done lest the child should roll over the test tube, break it and be injured. In female children, any small vessel with a rim around it may be applied to the perineum and the sample of urine obtained. If the urine contains albumin, one should eliminate the albuminuria of fevers and orthostatic albuminuria, before it could be taken as an evidence of other disorders *e.g.*, nephritis.

Urine may also be collected by placing a clean water-proof sheet beneath the child and transferring the urine passed over it to a conical glass. It is bad practice to collect a sample of urine by catheterization, and worse in children, unless it is absolutely necessary for a bacteriological examination.

A few general principles in the treatment of children are now outlined, with special reference to some common errors in pediatric practice.

Clothing.—I think, in this country, the greatest harm is done to children, in the matter of clothing, both during health and illness. Many a time, I have seen children lying bathed in perspiration in a stuffy room. It is more often the drenching of children in their own perspiration that is the cause of many respiratory illnesses including broncho-pneumonia, than their exposure to cold weather, which is more or less a rarity in Madras and the southern districts. The tropical heat in these parts is excessive and any severe clothing interferes with the dissipation of the heat, especially in the child with ill-developed heat-regulating mechanism. It often produces a partial circulatory disturbance of the internal organs that favours a catarrh of some of these organs. The idea of the lay public that the child should be clothed with pure flannel, as soon as it begins to feel warm, has to be corrected by medical men. Of course, there is some justification for clothing a child with a warmer clothing, on an unusually cold day or when the child is suffering from hyperpyrexia or is exhibiting any signs of a paroxysm of fever. It is also true that, in premature infants, where there is disproportion definitely marked between the small body weight and the large surface area, care should be taken to check the excessive loss of heat.

In healthy children, any fashionable ideas of the so-called civilization should never prompt any one to clothe them with anything but the bare minimum of light clothing.

Ventilation.—Ventilation does not mean circulation of air, as some of the lay public would have it. It is not uncommon to find the windows of a room closed completely in fear of a draught of wind where they keep an electric fan going, to avoid congestion of air in the room. It is entirely a wrong notion to think that fresh air is unnecessary where electric fans are used. Medical men are aware that no drugs or stimulants can take the place of fresh air. When I come across a child suffering from any ailments, chiefly those of the respiratory system, I always advise the parents to have it removed to a hospital or at least to an upstairs or to a fairly well ventilated room even in the neighbour's house, instead of prescribing glucose, brandy and 4th hourly injection. The first essential for any sick child is fresh air, which relieves to a considerable extent the anoxemia of respiratory troubles. It is our bounden duty to inform the parents of the advisability of

removing the patient to a well-ventilated place, even at the risk of losing some of our frequent visits. I am only pointing out here that it will not serve much purpose to treat a child with great care and all attention to nourishment and stimulants, if the only window through which air pervades into the sick room is one that is just over a dirty drain in the down floor.

Food.—The essentials required for keeping a life in healthy working order are, even as the philosophers state, sun, air, earth and water. We have plenty of sunlight in our country ; air has already been dealt with. The earth probably denotes the vitamins that are indispensable items in the food of every child. One has to remember that faulty foods are the cause of many ailments of children. It is as much an error, to give excess of flesh or artificially prepared carbohydrates to children as to withhold the vitamins essential for life. Children require the most natural foods; fruits, green vegetables, fresh cereals etc. Carbohydrates, in excess, cause caries of the teeth (first dentition) and this is aggravated by the mother's milk, deficient in quantity and quality, when she is underfed or is not judicious in her eating. Feeding of older children materially differs from that of infants. In this connection, the following extract from the authors' remarks on the supply of flesh diet for children is worth a serious attention. (Recent Advances in Diseases of Children by Pearson and Willie). "Viewed in a perfectly simple way, eating the flesh of animals seems a very uneconomical way of obtaining the products of the vegetable kingdom ; especially as in all probability in ingesting the animal's flesh we absorb deleterious products of its metabolism. We have become accustomed to the habit of meat—eating but it is not right to allow convention to deflect us from examination of the question as to whether it should or should not form part of the ideal diet fot the child."

When a child is ill, interrogation of the parents, with regard to the diet of the child from its birth is necessary and fruitful. In the treatment of children's ailments, carbohydrates and fruit-juices (not of the acid type) may be more freely allowed than proteins or fats. The administration of water is often neglected by the parents during children's illnesses, specially as they are always under an erroneous impression that water should be restricted as much as possible, in respiratory and abdominal troubles. It lies with us to educate them and explain to them that the administration of water helps the child much in diluting the toxins in the intestines and the tissues and excreting them through the

kidneys, bowels and skin. Water is one of the good remedies, on which we could safely place our sheet-anchor, in most kinds of diseases of children. On the other hand, insufficient supply of water during illness also leads to a parching of the mouth and often parotitis is the dreadful result, a very serious condition to treat in children. To uneducated parents, who are under a delusion that large quantities of water, will do harm, if administered to children during illness, the best way is to ask them to give barley water in sufficient quantities, to which they readily consent.

Fomentations.—These are to be used with great care in children. Many counter-irritants, that can be safely recommended to adults, find no place in children's ailments. A certain amount of reservation is necessary in ordering these to children, as the ill-advised fomentations often lead to burns or a devitalization of the skin that favours the formation of septic processes in or under the skin.

Application of ointments.—These are often prescribed for children's ailments. There is a long list of indigenous products, easily available, which are often applied simultaneously to extensive lesions of the skin. The absorption of such poisonous drugs interferes with the natural excretion of the urine, damages the renal parenchyma and often leads to a water-logged condition of the child, with serious consequences. In these cases, the danger is the effusion into all the serous cavities, the pleura and pericardium etc. I still remember vividly a case of a small boy, aged about 4, who was the only surviving son of the parents and died in 24 hours as a result of an application containing marking-nut (Semecarpus Anacardum=சேங்கொட்டை) for scabies, prepared by the father himself, an influential lawyer of the locality. It is in these cases that no time should be wasted and every effort made to dehydrate the system, to relieve the toxic absorption of the kidneys, and to strengthen the heart to tide over the crisis. It is wise to give a guarded prognosis in these cases, as parents refuse to believe that any external application can produce such a serious state and will impute the blame to the doctor's inadvertent use of medicines, if any untoward result should happen.

Dosage for Children.—The age is not the sole factor to be considered in calculating the dose for a child. I have often noticed that the dose, reckoned by age alone, has been too little, in cases of well-developed children, as it has been bigger, in those of ill-nourished children. It is our daily experience that we meet with children, who look much younger than the stated age and others

older than what they really are. The general build of the child is also an important factor that has to be weighed along with the age, in prescribing the dose for children. The stereo-typed formula of going by the age alone has to be broken in some of the cases, of course within reasonable limits. The fact that the effect of a given dose is inversely proportional to the weight of the individual (exclusive of adipose tissue), has specially to be remembered in children.

Out of the many formulæ for the regulation of dosage for infants and children, Fried's rule for infants is quite good and exact. The dose is obtained by multiplying the age in months and the adult dose and dividing by 150 *e.g.*, if a baby is three months old, the adult dose when multiplied by three and divided by 150, will give 3/150 or 1/50 of the adult dose. This rule may be applied to infants up to 18 months. I consider, this is more practicable than Clark's rule, which can be applied only after recording the weight of the infant.

With regard to older children, it has been my experience that Indian children are often able to stand a bigger dose than European children, *other things being equal*. Hence I would prefer Young's rule (multiplying the adult dose with the age of the child in years and dividing it by the age plus 12) to Cowling's, where the dosage is obtained by multiplying the adult dose with the age of the child at the next birthday and dividing by the adult age taken as 24.

Young's rule :—The dose for a child of three years is 3/3+12=3/15=1/5.

Cowling's rule :—The dose for a child of three years is 4 (the age at the next birthday) divided by 24=1/6th.

Indian children cannot stand a big dose of opium, which had better be avoided in toto. Somehow they stand a bigger dose of emetine, especially when they suffer from amoebic dysentery. If we apply Fried's formula and calculate the dose of emetine, it is, for a child of one year, not more than 1/13th grain. But I have seen, many a time, infants of 8 months old, standing a dose of 1/8th gr. emetine, without any untoward effect.

Time of administration of medicine etc:—Children, when they are awake, are always active and are at rest, only while they sleep. This fact should be remembered by us when a line of treatment is suggested for them. I shall here quote a precis of treatment, which I saw, was prescribed for a child aged 1 year and 1 month, in G. T., Madras.

(1) Mixture, two drachms every 3 hours,
(2) Brandy in water in the intervals between mixtures.
(3) Milk and barley water 2 oz. every four hours.
(4) Second hourly temperature chart.
(5) Camphor and cocoanut oil to be rubbed on the chest and back, once in 4 hours.
(6) Injection of collosal iodine both morning and evening.
(7) Bowel wash once in 8 hours.
(8) Tepid sponge twice a day.
(9) Ice to the head, when the temperature is above 102°.

This was a child, suffering from broncho-pneumonia, running an irregular temperature of 102° to 104°, with occasional convulsions, for a week. One is really happy to see the enthusiasm of the doctor in treating this patient; but it is no exaggeration to state this child has had to be disturbed *at least once every hour* for the administration of medicine or carrying out other lines of treatment chalked out by the doctor.

It is plain that a child requires more rest than an adult and much more so, a sick child, especially when it is having hyperpyrexia. With all deference to the doctor, I am inclined to suggest that the disturbance to this sick child was enormous and the resistance to infection was bound to diminish, as a result of repeated encroachment on the much desired rest for the tender patient. It remains for me only to emphasize, that the mixture, time of administration of injection etc., should be so regulated, as to allow a sufficient interval of not less than three hours, during which period the child can sleep and rest.

A common cause of a complaint which is atypical in nature, with irregular fever, often attended with respiratory ailments and not responding to any definite line of treatment is worms. This may, with advantage, be remembered in pediatric practice as a dose of anthelmintic is all that is necessary for curing the child.

A glycerine enema is very helpful as an adjunct in certain ailments in children. It brings down the temperature at least for the time being, relieves the abdominal distension, helps the free passage of urine and gets rid of any toxins or irritating substances in the lower bowels. It also induces a mild peristalsis which is often useful in relieving constipation. I feel it is profitable to remember this, in the treatment of children.

In conclusion, I have only to express that the aim of this

paper is to point out a few preliminary observations on children's disorders, and to show that it is often more difficult to treat children than adults.

I am much indebted to Dr. T. Bhaskara Menon, M.D. (Mad.), M.R.C.P. (Lond.), Pathologist, Government Rayapuram Hospital, Madras, for some valuable corrections in this paper.

DIAGNOSIS AND TREATMENT OF DIPHTHERIA

BY

DR. PURSHOTAMDAS T. PATEL, M.D., (LOND), M.R.C.P., (LOND), D.T.M. & H. (CANTAB), F.C.P.S., (BOM.),

Hon. Physician, K. E. M. Hospital, Medical Superintendent, City Fever Hospitals, Arthur Road and Maratha Tuberculosis Hospital, Bombay.

DIPHTHERIA is an acute infectious disease caused by the Klebs-Lœffler bacilli characterised by local fibrinous exudate (a membrane) upon the mucous membrane of the throat, larynx or nose and by constitutional disturbances due to the absorption of toxins produced at the site of the lesion.

In 1875 Bretonneau, a French Physician, first established it as a specific disease. He gave it the name of diphtheria from the Greek word meaning a membrane, thus to distinguish it from other kinds of sore throat. Before that time it was known to the world by different names *e.g.*, morbus strangulatorius meaning laryngeal diphtheria. The causative organism was discovered by Klebs in 1875 from the membrane and later Lœffler established the specificity by culture and animal experiments. Hence the bacillus was named after both, Klebs-Lœffler bacillus.

Main types of diphtheria are faucial, nasal and laryngeal. Rarely conjunctiva, if affected. Of these, faucial is the one usually met with. Next comes laryngeal and then nasal. Nasal type is often not diagnosed early as the cavities are rarely examined and suspected. Laryngeal type is the most dangerous to treat as it often requires tracheotomy, which in children is an operation rather dangerous if not properly attended to.

Diagnosis.—As early administration of serum is very efficacious in this disease, one must take a provisional diagnosis on purely clinical symptoms. Many cases are not diagnosed because the throat of children suffering from fever and sore throat is never examined as a routine procedure. Many cases are thus left off not

properly diagnosed and hence labelled as influenza or irritable throat. Only when serious symptoms like dyspnœa or foul odour are noticed or cardiac symptoms supervene, then, the attention of the doctor is drawn to throat examination. Cases are recorded as influenzal bronchopneumonia till the fauces or larynx is absolutely choked up with membrane. Hence whenever there is a complaint of throat, one should examine it thoroughly and get the exudate examined bacteriologically. If suspicious, there should be no delay in administration of serum whilst awaiting the report. Clinically positive cases or even suspicious ones should be immediately injected with 4,000 to 8,000 units of concentrated diphtheritic serum.

The main features of the disease are:—

(1) Gradual onset of fever. In this disease fever and pain in throat do not play important roles. Malaise accompanying the fever is rather more than usual as the disease advances. It is for this reason that patients do not stick to bed early unless forced, hence the delay in treatment.

(2) Sore throat with membranous exudation on soft palate, uvula, fauces, tonsils and in larynx, in cases of laryngeal diphtheria.

(3) The membrane is whitish rather than yellowish.

(4) It is adherent and thick sometimes sloughing if left alone, bleeding on attempts at removal.

(5) It generally involves the palate, nose and pharynx, there is relatively slight pyrexia.

(6) There is generally enlargement of deep lymphatic glands of the neck giving the appearance of "Bull-neck".

(7) Circulatory disturbances generally manifest themselves late. Pulse is quick and sometimes irregular. Blood pressure is low and there may be hæmorrhages with cold extremities and collapse.

(8) Albuminuria with very little pyrexia is often present indicating kidney damage.

(9) Mental disturbance is absent after onset, but supervenes as the case is becoming fatal.

(10) Nervous complications in the form of paralysis of

palate (soft) indicated by nasal twang or paralysis of cillary muscles and in grave cases paralysis of the diaphragm and limbs are also important in late stages.

(11) The best and the surest test to diagnose a case of diphtheria is bacteriological. The child is taken by the mother on her lap and the head is fixed by another person; with an angular tongue depressor, the tongue is pressed down with the jaw, light from behind enables the fauces to be seen clearly. With a sterile swab the membranous portion is touched, a piece is removed, a smear is made and examined after staining with Lœffler's methyline blue or Gram's stain or both. A culture is made on Lœffler's serum agar, which should be examined after 12 to 24 hours for diphtheria bacilli (uniform whitish growth). The diphtheria bacilli are stained blue with Lœffler's stain with granules deeply stained. They are always in groups appearing like Chinese letters. With Gram's stain they appear blue *i.e.*, gram positive. This would be the best method for differentiating diphtheria from many other allied diseases like thrush, follicular tonsillitis, vincent's angina etc.

Treatment.—Steam inhalation with antiseptics, such as Oil Eucalyptus, Menthol and Tinct. Benzoin co. equal parts of about 15 to 30 minims in a pint of water should be at once started. The nozzle of the kettle is inserted under the mosquito curtain well covered with bed sheets. The antiseptic steam is very good for the throat and several dyspnoeic cases have settled very well with this and the serum.

Diet should be nutritious. No hard substance which requires muscular exercise should be given till the pulse becomes normal. Milk and glucose are the main sources. The main idea of perfect rest to the heart is good and rest to the heart is absolutely essential.

Measures in children's institutions:—Outbreaks in schools etc. require general examination of the throats for bacilli and a sharp look out for slight sore throat and nasal discharge.

Active immunization by toxin antitoxin mixture of susceptible children is indicated in schools, hospitals and orphanages, after a positive Schick's test which shows suspectibility to diphtheria.

Preventive measures.—Antidiphtheritic serum 500 units to a child, unto 1500 in an adult should be given to all the contacts, immunity lasts about 3 weeks and renders the person hyper-sensitive to a second dose of the serum to avoid which, serum should be given again after an interval not longer than one week. The throat requires syringing and gargling with peroxide and other antiseptics (Permanganate or chlorine solution).

Treatment of carriers.—Any morbid condition of the throat, nose and sinuses should be remedied. Local antiseptic treatment and active or passive immunization and isolation are other measures to be tried.

Examination of the patient before discharge from hospital or home:—Throat must be normal, and bacilli must be absent. Discharges from ear, nose and throat should have cleared up. The ear or nose discharge is not likely to be infective after 3 months.

Curative treatment.—Faucial Type:—The following are the definite steps in the treatment of an average case. It will, of course, be necessary to vary the measure to suit individual cases.

In mild, early or doubtful cases according to the age (2 to 8 years) and size of the body, inject 2,000 to 4,000 units intramuscularly immediately (without waiting for bacteriological examination) in one of the lower and outer quandrants of abdomen or outer side of thigh or arm.

In cases on 2nd or 3rd day with membrane, formed according to the severity of symptoms and extent of membrane, inject 10,000 to 15,000 units to be repeated once or twice in 24 hours, over a period of 4 days making the total quantity to about 40,000 units. Some authorities advise upto 100,000 units.

In severe and late cases with toxæmia and complications inject 16,000 to a maximum of 30,000 units intravenously, if possible, or through the anterior fontanelle in very young children, and repeat within 12 hours if there is no improvement. Although it is the general belief that antitoxin is not of much use after the 4th day of the disease, in this country we have had some late cases greatly benefited and recovery has ensued although serum treatment was begun after the 6th or 7th day. It is best to use a concentrated antitoxin. Absolute rest in bed is essential. The foot of the bed may be raised if there is weakness of the circulation. Steam kettle (bronchitis) with the patient in a gauze tent or mosquito curtain, for continuous inhalation of steam, loosens the membrane and secretions. To every pint of water in the

kettle a dram each of oil of eucalyptus and the compound tincture of benzoin may be added.

The throat should be swabbed twice a day with hydrogen peroxide (diluted with an equal part of water), or eusol, or weak chlorine solution.

Symptomatic treatment should be carried out and the circulation should be supported. For fever, salicylates and diaphoretics may be given. If the pulse is weak and fast, the following mixture may be exhibited four hourly (for a child of 5 to 8 years)

℞

Caffein. Citrat	...	gr. i
Tr. Nucis Vom	...	♏ ii
Spt. Camphor	...	♏ iv
Syrup. Aurant	...	ʒ ss
Aquam ad	...	ʒ ii

Ephedrine gr. ¼ may be given or adrenalin solution ♏ ii to v may be put under the tongue or injections of cardiozol ½ c.c., or adrenalin ♏ iv may be given four hourly if necessary.

In sudden collapse inject ephedrine or adrenalin ♏s. iv with atropine gr. 1/200 to be repeated if necessary after 4 hours.

Normal saline 10 oz. with 10% glucose may be given subcutaneously twice a day. Some authorities advise simultaneous injections of Insulin 5 to 10 units.

Besides the above general treatment, if there are signs of obstructions in the throat, Intubation or Tracheotomy should be performed.

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SURGICAL EMERGENCIES

BY

LT. COL. B. G. MALLYA, I.M.S.,

Howrah.

IT is proposed to briefly deal with some of the more common surgical emergencies of infants and children under this head. It is likely that some of these have been dealt with more fully in other parts of this number of the journal.

1. **Umbilical Infections.**—As a rule the cord separates about the fifth day and a slight serous discharge may be present for a few days. This is of no consequence. In some cases there may be oedema of the umbilical folds and a discharging ulcer may be found on separating the folds. This ulcer heals up on applying some antiseptic dressings. Omphalitis or umbilical cellulitis is a more serious condition in which the navel projects as a conical swelling and the inflammation may spread to the symphysis pubis. There is fever, diarrhœa or vomiting and restlessness. The treatment consists in applying hot compresses and incising the inflamed areas and abscesses. In collapse, stimulants and saline injections should be given. If convulsions occur, chloral and bromide must be given per rectum. Umbilical Phlebitis is rare and the infection spreads to the liver producing multiple abscesses and jaundice. This condition is fatal and treatment is of no avail. Hæmorrhage from the navel—this may be stopped by applying another firm ligature. Pressure with a pad after applying adrenalin may stop the hæmorrhage in some cases. If these measures fail, a needle should be passed under the umbilicus and a thick silk ligature wound round the needle in a figure of eight fashion. This will control the hæmorrhage.

Septicæmia and Pyæmia may be caused by umbilical infection. Streptococci and staphylococci are the principal organisms that cause general sepsis. Oedema, jaundice and hæmorrhage are the principal symptoms. Vomiting and diarrhoea may be present. There is an irregular type of temperature. Prognosis is bad. Treatment consists in letting out collections of pus and supporting the defensive mechanism of the body and giving stimulants.

2. **Melæna Neonatorum.**—This is a serious condition which begins about the third day after birth and blood clots are noticed in the meconium. Bleeding may occur from the mouth, nose and navel. The temperature is subnormal, the pulse is rapid and

feeble and there is a pallor of the skin which suggests loss of blood from the body. The treatment of this condition consists in injecting 10 c.c., of the parent's blood daily for two or three days.

3. **Tetanus Neonatorum.**—This is caused by umbilical infection. The first thing noticed is difficulty in sucking which may be noticed between the third and tenth day.

Retraction of the head, opisthotonus and tonic contraction of the muscles may be present. The infant cannot swallow. The diagnosis is not difficult. *Treatment*—Antitetanic serum should be given intrathecally by the lumbar route. It should be injected subcutaneously round the navel to prevent further absorption of toxins. Nasal feeding is necessary in these cases. Spasm of the muscles may be controlled by giving chloras hydras in one grain doses by the mouth or double this by the rectum. Most of the cases die.

Ophthalmia Neonatorum.—This is one of the chief causes of blindness. The first thing noticed is a swelling of the eyelids. The discharge, muco-purulent at first, becomes thick, creamy and yellow. On separating the lids, the pus squirts out with great force and there is a risk of the doctors and others getting infected. The conjunctiva is red and inflamed. Treatment is prophylactic and curative. Application of a drop of 2% silver nitrate solution to the conjunctiva directly after birth as suggested by Crede has considerably reduced the incidence of this terrible scourge. Curative treatment consists in frequently irrigating the conjuctival sac with perchloride of mercury 1 in 10,000 or potass permanganas 1 in 1000 and instilling one drop of a solution of acriflavine in castor oil 1 in 1500. The everted lids may be painted with a 2% solution of silver nitrate. If the cornea is hazy, atropine sulph ½% must be instilled into the eyes.

4. **Erysipelas.**—This is caused by an invasion of the skin by the streptococcus. The skin is of scarlet red colour and the infection spreads rapidly. In infants the infection is of umbilical origin and the disease is fatal. Some cases of vaccination may develop erysipelas. The temperature is high and the redness spreads rapidly. Antistreptococcus serum should be given in 10 c.c., doses subcutaneously. Ichthyol 10% in glycerin or lanoline is the best local application. To prevent the infection from spreading the healthy skin one inch away from the red margin may be painted with liniment Iodi.

5. **Imperforate Anus.**—The chief symptom of this condition is non-passage of meconium. The infant is at once shown to a

doctor owing to the serious state of affairs, as the abdominal distension increases with the passage of time. In simple cases an incision from the central point of the perineum to the coccyx is sufficient and in order to prevent union, vaseline gauze should be packed into the anus. In more severe cases deep dissection keeping close to the middle line and the hollow of the sacrum will find the bulging rectum which, on incising, lets out the meconium in large quantities. The margins of the rectum should be stitched to the skin and to prevent stricture frequent dilatation of the anus should be carried out. In cases where the rectum cannot be found, the abdomen should be opened and the rectum mobilized and brought to the perineum. Colostomy may be done as a life saving measure but the prognosis is bad in these cases.

6. **Procidentia Recti.**—Weakness of the pelvic muscles and loss of peri-rectal fat lead to this condition. Wasting diseases of childhood, phimosis, worms, diarrhœa and constipation may cause a prolapse of the rectum. Three types of prolapse occur. In the first type the prolapse which occurs with defecation can be easily reduced. In the second type it occurs between the acts of defecation. In the third type it remains down as a sausage shaped swelling with a central hole. The first type of case is treated by replacing with gentle pressure and treating the cause. In the second type of case, after reduction, the buttocks should be strapped. In the third type of case alcohol injections into the submucosa may be tried.

Operative treatment—Drawing four lines with the thermocautery at a dull red heat along the mucous membrane cures some cases. Colopexy is not needed for children. The rectum may be transfixed after reduction of the prolapse by a strong needle threaded with thick silk and passed from one buttock to the other and traversing the muscular coat of the posterior wall of the rectum under the guidance of a finger in the rectum.

7. **Strangulated Hernia.**—Abdominal pain is the chief complaint and on examination it is found that the hernia is swollen, tender and irreducible. There is vomiting and absolute constipation, not even flatus passing. In the later stages the vomiting is of the stercoraceous type. Taxis may be tried but the treatment is operative. Divide the coverings of the cord and identify the sac by the arborescent vessels on its surface. The neck of the sac may be divided by the aid of a hernia director and knife or by open dissection. Open the sac and examine the contents.

If the sac contains clear serous fluid it indicates that the

contents are viable and may be returned to the abdomen. The colour of the gut will indicate if it is fit to be returned to the abdomen. Where the gut is gangrenous a resection will have to be done if the condition of the patient can stand this procedure; otherwise, the gangrenous loop is brought out and cut away and Paul's tubes may be tied into the open ends for drainage. Umbilical hernia disappears spontaneously by the age of 10 or 12 years and no operation is needed till this age is passed.

8. **Acute Appendicitis.**—The appendix of the child contains more lymphoid tissue than that of the adult and is thus more liable to infection. The attack comes on generally at night or early hours of the morning and the child vomits and complains of pain in the abdomen round the umbilicus. The pulse is rapid and the temperature is raised and on examination some tenderness and rigidity is found in the right iliac fossa. An abscess may develop or if the appendix bursts general peritonitis may set in. Diagnosis is easy and the treatment in children is an operation at all stages of the disease. The abdomen is opened by a para-median incision and in every case the appendix should be removed. In cases where there is definite evidence of an abscess the gridiron incision should be made and the abscess drained. After-treatment consists in putting the patient in the Fowler position and administering 10% glucose per rectum. Morphia ¼ grain may be injected to rest the abdominal contents. Purgatives should not be given.

9. **Burns.**—The mortality in children from burns is very high. The introduction of tannic acid treatment has lowered the mortality. Shock is the thing that demands treatment before the burns are attended to. Even now this is neglected and energy wasted on applying dressings to burns without treating the shock first and the inevitable result is that the patient dies before the ritual is completed. A morphia injection is given and artificial heat to keep the child warm. 10 c.c., of 25% glucose may be given intravenously. Having treated the shock first the burns are cleansed with methylated spirit and any vesicles are cut away and the parts dried and two and half per cent tannic acid solution is sprayed every half hour till a thick coagulum forms. 1 in 1000 perchloride of mercury solution may be added to the tannic acid solution with advantage. This may be left undisturbed till the coagulum separates. The introduction of tannic acid spray has revolutionised the treatment of burns.

10. **Quinsy.**—An acute tonsillitis may turn into this condition and the child complains of pain in the throat and inability to swallow. There is salivation and the breath is foul and offensive. The tongue is furred and the child is acutely ill. Examination is difficult as the opening of the mouth causes pain. The abscess may burst spontaneously. With a guarded knife the abscess should be opened as soon as the diagnosis is established. Potassium chlorate gargles should be given. Bowels should be cleared by calomel and magnesium sulphate. Plenty of fluid nourishment should be given.

11. **Cancrum Oris, Noma or Gangrenous Stomatitis.** — This is generally found in debilitated marasmic children after one of the acute fevers or in children suffering from kala-azar. Generally, a swelling is noticed on one cheek and on the inner aspect of it an unhealthy ulcer appears which discharges a fluid with a foetid odour. The ulceration soon spreads and may invade the gums and jaw. The teeth get loose and may drop off. The child looks very ill and there is severe constitutional disturbance. The breath is extremely foul and offensive. Treatment consists in free excision of the affected area under a general anæsthetic and touching with pure carbolic acid the excess of which is neutralized by alcohol. Defects in the cheek and teeth may be dealt at a later date by plastic operations and suitable dentures.

12. **Foreign Bodies in the Air Passages.**—These may be found in the larynx, trachea or bronchi. They vary in nature from pins, nuts, buttons, teeth to pieces of bone or meat. If lodged in the larynx, the foreign body may either block the air passage or irritate the vocal cords. Violent coughing sets in and the child becomes cyanosed. An attempt should be made to remove the foreign body with the finger or forceps but if the child is unconscious or the attempt to remove fails a tracheotomy should be done at once with any knife at hand. Pen knives come in useful for this kind of emergency work. If the body is in the trachea or bronchi, it causes bouts of coughing and stridor. Cyanosis and indrawing of the epigastrium is typical of obstruction to passage of air. An X-ray examination will show the foreign body. It is more common to find the foreign body in the right bronchus than the left as the right is in a line with the trachea and is larger in size. Under an anæsthetic, the bronchoscope is passed and the foreign body is removed with a suitable forceps. In cases where a bronchoscope is not at hand a low tracheotomy should be performed as the foreign body may be coughed out during a bout of coughing. This method is simple and may be carried out in places where there is no bronchoscope.

13. **Intussusception.**—Though this may occur at any age it is common from nine months to two years. The ileocœcal variety is the commonest and it is due to an increase in the amount of lymphoid tissue in the ileocœcal region. Intussusception consists of three parts-a sheath or outer tube, the returning tube and the entering tube. A child in good health is suddenly taken ill with a severe pain in the abdomen. The pain disappears only to return again in a short time. The child may vomit and the stools are frequent and contain blood and mucus but no foecal matter. The abdomen distends and the child collapses. On palpating the abdomen a sausage shaped swelling may be felt during the attacks. On examining the rectum the swelling may be felt and the finger is covered with blood. The stools are like red currant jelly. As soon as the case is diagnosed, the abdomen should be opened and the intussusception should be reduced. Gentle handling is necessary and warm packs should be used to apply gentle pressure to reduce the œdema and empty the vessels. If irreducible the mass may be resected and end to end suturing should be done. Some air may be pumped into the bowel through the anus by a Higginson's syringe. Spinal anæsthesia is indicated in these cases as it relaxes the gut and some cases reduce themselves spontaneously after spinal anæsthesia.

14. **Epistaxis.**—Bleeding from the nose may be due to local causes or general causes. Amongst local causes may be mentioned injuries, violent blowing of the nose, chronic catarrh, syphilltic ulceration, nasal diphtheria or nasal polypi. Heart disease, blood diseases such as hæmophilia, purpura and leukæmia, and rheumatism are the general causes. Bleeding from the nose occurs frequently in children and is not of much importance. The blood comes from the anterior portion of the septum and from one nostril. By way of treatment the child should be made to sit up and the anterior nares compressed. Ice bag may be applied to the face or neck. The nostrils may be packed with gauze dipped in 1 in 1000 adrenalin chloride. Sitting up posture and holding the arms above the head may be tried. In addition to the immediate local treatment the cause should be dealt with.

CONGENITAL PYLORIC STENOSIS

BY

LT. COL. B. G. MALLYA, I.M.S.,

Howrah.

THIS disease is characterized by a thickening of the pyloric sphincter and gastric stasis. Various theories have been propounded to explain its etiology. It is said to be an inherited defect and some evidence has been adduced in support of this theory. Another view is that it is due to a breakdown of the neuro-muscular mechanism of the stomach and pylorus. Pathologically one finds great hypertrophy of the circular muscular fibres of the pylorus. The lumen of the pylorus is occluded or may admit the passage of a probe.

The disease is more common amongst the first born infants of the male sex. Very few cases have been recorded in this country. It may be that these cases are not seen by medical men at all as the disease occurs during the first three weeks of life.The symptoms set in during the second or third week. The infant has no inclination for food or else is easily satisfied. One or two feeds are retained and without any cause the infant vomits. The vomiting soon becomes of a projectile type and the contents of the stomach are shot out with great force and it is dangerous to stand in front of these infants as the examining doctor may have a shower bath. There is constipation.

On examination a globular swelling is seen and felt in the epigastric region after a feed or on tapping the epigastrium. The lower abdomen is flattened. The pylorus may be felt as a small hard nodule to the right of the middle line of the body and a little above the umbilicus. After a feed peristaltic waves may be seen passing from left to right.

Diagnosis is clinched by the history of projectile vomiting in an infant two to three weeks old, the presence of visible peristalsis and the finding of a hard palpable pylorus X-ray examination is not as a rule necessary but may be done in doubtful cases.

Treatment is surgical. Medical treatment is of no avail. Anti-spasmodic drugs such as atropine have been tried. Lavage of the stomach with bicarbonate of soda drachm to the pint is worth trying.

The modern treatment is operative and consists in doing a Ramsted's operation. It can be done under local anæsthesia or

gas and oxygen. 5% glucose solution should be given subcutaneously two hours before operation. Parent's blood may be transfused if necessary. The stomach should be washed out an hour before the operation.

Under local anæsthesia, the abdomen is opened by a high paramedian incision. The pylorus is gently brought to the surface and a longitudinal incision is made into the peritoneum and the superficial muscular fibres. With a blunt dissector the deeper muscular fibres are separated till the mucous membrane projects. Any bleeding points are secured and the pylorus is returned to the abdomen. The abdominal wound is closed without any drainage.

Nothing is given by the mouth for four hours after the operation during which period glucose may be given subcutaneously. After four hours five per cent glucose solution should be given by the mouth in drachm doses every half hour. Eight hours after the operation mother's milk may be given diluted or skimmed milk may be given in two drachm doses every hour. Operative mortality varies according to the experience of the surgeon and the general nutritional state of the infant.

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TUBERCULOUS CERVICAL ADENITIS IN CHILDREN

BY

V. M. KAIKINI, B.A., M.B., B.S., F.R.C.S., (EDIN.),

Hony. Surgeon, King Edward Memorial Hospital, Bombay.

INFLAMMATION of the lymphatic glands is a very common complaint in children and tuberculous adenitis is the commonest type of disease of the glands for which a surgeon is consulted. Especially in a child if a few glands in the neck become palpable, tubercle is the first disease that is thought of. But it must not be forgotten that there are many conditions other than tuberculosis and much milder than that which may be at the bottom of the enlargement. But all the same tuberculous adenitis in the neck is very common in children and if not promptly treated grave results may follow.

The disease is most common between the ages of three and ten. At that period there is greater liability of coming into contact with the organisms through infected milk or through direct contact; the lymphatic system is very profuse, highly active in absorptive functions, and partially educated in its properties of resistance.

In Europe where only cow's milk is drunk and many a time unboiled, bovine variety is commoner than human. But in India especially in Bombay and some other provinces buffalo's milk is more commonly drunk and is always boiled before use, so, bovine type of tuberculous infection is less common than human. Want of proper nourishing diet *e.g.*, animal fats in the form of milk and milk products, poverty etc., are at the root of the complaint being seen so frequently among the poor classes in India. As a matter of fact in infancy external nodes are not so often involved as the bronchial nodes which are invariably the seat of infection. These unobserved foci may sooner or later cause secondary tuberculous lesions either in the kidney, testis or bones.

As regards tuberculous adenitis in the neck, the portals of entry are :

(1) *Lymph stream.*—The three areas which are the chief centres of original infection are :

  (*a*) the faucial tonsil ;

  (*b*) nasopharyngeal adenoids ;

  (*c*) the teeth. These original foci may themselves be unaffected although they permit the passage of organisms by harbouring them. When pulp is affected in dental caries it carries the infection to the glands.

(2) *Blood infection.*—Some children are already the victims of tuberculous septicaemia. In this case the infection might have travelled through the intestinal canal or the bronchial glands.

Four groups are especially liable to be affected *viz.*, the submaxillary, the parotid and anterior, posterior and superior group of the vertical chain.

Changes in the Individual Glands.—The average gland is kidney shaped. At the hilum, blood-vessels enter and leave. The afferent lymphatics enter the gland at various sites around the convexity.

The capsule of the gland is of fibrous tissue and from its

deep surface septa dip inwards which are connected by connective tissue. In the case of blood infection, the disease manifests in the centre of the gland where the large vessels break up into capillaries. In lymphatic infection the disease is first manifest at the corridor (a narrow channel between the lymphoid tissue of the interior and its fibrous capsule bridged across with strands of connective tissue), where the interlacing septa of connective tissue are of the nature of filters.

At first the tubercular follicles appear as greyish white nodules. They coalesce and produce a focus, then pus forms and progresses till capsule is reached. After the capsule is perforated periglandular tissues are involved. This may later on lead to the formation of a sinus. Connective tissue of the gland increases at the expense of the lymphoid tissue. Gland is more fibrous and endothelial cells proliferate. When periadenitis occurs, the gland is enlarged, tender and indistinct in outline.

There are three types of tuberculous glands in the neck.

(1) *Caseous type.*—This is the most frequent type. Softening is always present and later on cold abscess is formed.

(2) *Lymphoid type*—This resembles lymphadenoma and is many a time mistaken for it. The glands remain descrete. There is little or no periadenitis. Caseation if present is very late and occurs in the shape of small spots in the substance of the gland. There is excessive proliferation of endothelial cells of the lymph sinuses.

(3) *Fibrous type*—This is more common in adults and old people. The glands are small, hard and adherent to the surrounding tissues and to each other. They are so fibrous and surrounded by fibrous tissue that enucleation is out of question and even dissection is very difficult. There are points inside the glands of central caseation.

Symptoms.—As in the case of tuberculous lesion in any other tissues in the early part of the disease, there are no symptoms except the swelling in the glands which begins gradually. In a few cases the onset appears to be acute, the swelling comes on with fever and reaches a considerable size, reaches its maximum in a few days. These acute symptoms last a short time but the enlargement of the glands persists. The course of the disease is

characterized by remissions and exacerbations. During exacerbation the glands may be painful and tender and show the usual signs of local inflammation.

As a general rule in the beginning the glands are round in shape, firm to the feel and painless. Later on, as caseation progresses and periadenitis occurs, the glands become tender, boggy, fluctuating and matted together. Later on, the skin becomes discoloured and finally gives way and there is discharge of thick curdy pus, which may continue for an indefinite time.

When abscesses are allowed to open spontaneously, large irregular and often very intractable ulcers form. The skin is undermined for a considerable distance and it has an unhealthy appearance. When the infection of the glands is lymphatic, the general health of the patient is seldom affected. But when the infection is hæmatogenous, the patient is usually found to be suffering from fever, debility and all the symptoms of tuberculous toxæmia.

Prognosis.—If the infection is lymphatic the prognosis is good. Blood infection which is suggested by coexistence of tubercular lesions in other parts of the body, irregular distribution of the disease in the neck, central manifestation of the disease in the gland in the form of caseating points increases the gravity of the disease. During the first two years of life, it is serious as meningitis is common. Involvement of jugulo-digastric group of glands is favourable because it indicates local infection. Disease of posterior chain is unfavourable because of the possibility of retropharyngeal abscess and also the involvement of the supraclavicular chain as it indicates that the primary focus must be in the mediastinal glands.

Diagnosis.—In the first place it must be remembered that enlargement of glands is very common in children as the lymphatic tissue is very active in infancy. Parents are frightened when they find enlarged glands in their children which in many cases are only inflammatory and non-tuberculous. Non-tuberculous inflammatory glands are superficial mostly along the course of the external jugular vein, softish in consistency, flat and oval in shape freely movable underneath the skin and slightly tender. While early tuberculous glands are round in shape, painless and firm in consistency.

Simple acute and subacute adenitis.—Symptoms of acute inflammation like severe pain, fever, redness and swelling with suppuration are present. The duration is very short. Usually the

primary septic focus is detected either in the mouth or round about the neck area. After the pus in the suppurating gland is let out healing is rapid.

Lymphadenoma.—This is not very common in young children. The groups of nodes in other parts of the body are involved simultaneously or in rapid succession. There are no signs of inflammation or caseation and the swellings are usually accompanied by very marked and definite general symptoms and blood changes. The glands are homogeneous on cutting and found in groups and are not matted together as in tuberculosis.

Lymphosarcoma.—This is very rare. It increases very rapidly, vary after attaining a great size in a few months.

Glandular fever.—This occurs in epidemic form. The distribution is bilateral. Usually the glands in the angle of the jaw are involved, the swelling being more diffused. Suppuration is common. There is great tenderness and also associated tonsillitis. In this case also there is rapid healing after the abscess is opened and pus is let out.

Treatment.—In cases which have not gone to the stage of suppuration, conservative method of treatment may be employed. Animal fat, milk and milk products like butter etc., should be given in large quantities, also cod-liver oil with iron in some form. General hygiene is of importance.

Local vascularity should be encouraged so that later on barriers of fibrous tissue are deposited around the diseased focus. Hot fomentations with mag. sulph or boric are given till periadenitis has subsided. Local skin applications are not of much use. Foci of infection like tonsils etc., should be removed if they are inflamed.

Cervical collar of paroplastic which holds the head steady, well padded, worn day and night is some times very useful.

X-ray and radium give the best results in the lymphoid type of the disease and cases where suppuration has not progressed. They should not be given if operation is contemplated, as fibrous adhesions follow their use. Tuberculin similarly produces adhesions.

Operative treatment gives best results when the infection is lymphatic and localized. After pus formation has occurred, the only treatment that is useful is operative. On the whole, the ideal method of treatment seems to be to remove all the glands by operation and then submit the part to X-ray or radium exposures, to destroy the remnants of tuberculous lesion left behind after operation.

Contraindication for operation :—

(1) If the tuberculous infection is hæmatogenous.

(2) If distribution is haphazard and irregular.

(3) If the disease is fibrous in type.

(4) Where the disease has been previously treated by incision and curetting.

(5) in the first year of life.

Operation will not give good results in early periadenitis. If the patient is suffering from tuberculous toxæmia a short course of tuberculine may be given before operation just to get rid of the symptoms of toxæmia like fever, anæmia etc.

References :

(1) Diseases of Children—Holt and Howland.
(2) Surgical Diseases of Children—John Fraser.
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(4) Ward Clinics—Sir Harold Stiles of Edinburgh.

MENINGITIS

BY

LT. COL. B. G. MALLYA, I.M.S.,

Howrah.

THIS disease is characterized by an inflammation of the piamater and the arachnoid and is a common affection of the nervous system in children. The disease is of more serious import in children than in adults. Meningitis may be conveniently classified into :—

(1) Meningococcal meningitis.
(2) Tuberculous meningitis.
(3) Pneumococcal meningitis.
(4) Septic meningitis.
(5) Syphilitic meningitis.
(6) Remaining varieties.

1. **Meningococcal meningitis**—also known as 'Spotted Fever' is caused by the Diplococcus Intracellularis Meningitidis of Weichselbaum which is a Gram negative organism. In infants, the disease is known as Posterior Basic Meningitis and in older children as Cerebro-spinal meningitis. The disease occurs in the

winter months and may be met with either in epidemic or sporadic forms.

Posterior basic meningitis sets in with a convulsion in infants and there is fever and vomiting. Retraction of the head is characteristic and points to a diagnosis of meningitis. Owing to the increased intra-cranial pressure there is bulging of the fontanelle and twitching of the arms and legs. In the later stages there is marked retraction of the head and opisthotonus.

The eyes assume a fixed staring appearance and strabismus may be present. Blindness is common and may be permanent.

Diagnosis is established by a lumbar puncture and finding the organisms in the cerebro-spinal fluid.

Cerebro-spinal meningitis occurs in children and the onset is sudden. There is severe headache, vomiting and fever. The neck is rigid and there may be delirium. There is tenderness along the spine and cutaneous hyperaesthesia. One of our cases complained of diplopia and this led to diagnosis of the case after lumbar puncture. Strabismus is seen. Blindness is common. Skin eruptions have not been seen in our cases. Arthritis of the knee joint is seen in some cases. Rigidity of the neck is an outstanding feature and if present should lead to a thorough investigation of the case. Diagnosis is established by a lumbar puncture and the character of the fluid and the force of the stream. The fluid is turbid and later purulent and full of polymorphonuclear leucocytes. Meningococci can be demonstrated by staining. Cultures may be grown.

Prognosis.—Early diagnosis and administration of serum may bring about a successful result. Compared with other forms of meningitis this is the only one where there is any hope of a cure though some cases are fulminating and die in a few hours. Complete recovery takes a long time. Some cases show sequelæ such as blindness, deafness, hydrocephalus and mental deficiency.

Treatment—This is a notifiable infectious disease and cases should be isolated in a special ward. Contacts should be given dilute Condy's gargle and some fluid should be sniffed up the nose. There being several types of the organism, success in treatment depends on selecting a suitable serum prepared from a local strain and in Bengal, serum has been prepared from local strains by the Bengal Immunity Company and the Bengal Chemical and Pharmaceutical Company and the results obtained from the administration of these sera have been encouraging. The quantity given should always be less than the amount of cerebrospinal fluid drawn off. Serum may

be given daily for four days or until the meningococci disappear from the cerebrospinal fluid. As regards the route, intrathecal is the best. Cisterna puncture should be done and serum given by this route in cases where there is no improvement by the lumbar route. The foot of the bed must be raised after injecting the serum. The only drug which is worth administering is urotropine which may be given in 5 grain doses t. d. s. Cylotropin injections intravenously have been tried. Glucose may be given intravenously.

Tuberculous Meningitis.—This occurs in children during the second and third years of life. It may, however, be met with at all ages, the earliest being the third month. The infection is carried to the meninges by the blood stream and the source may be traced to the abdomen, bones and joints or lymphatic glands. The disease has a slow and insidious onset. The child takes no interest in play and is dull and apathetic. The body is tender and there is hyperaesthesia. Mild fever may be present. The pulse, rapid at first, becomes slow and irregular in the later stages. The neck is stiff but there is no retraction. Convulsions occur at all stages of the disease. Constipation is present and the abdomen is retracted. The reflexes are exaggerated in the early stages and rhythmic movements choreic in type may be seen. In the later stages limbs are paralysed and the reflexes are lost.

The duration of the disease is from a week to three weeks and the termination is fatal. Paralysis of the external rectus is the commonest eye symptom though other forms may be met with. The pupils, contracted and irregular in the early stages become dilated in the later stages. There is papilloedema of the optic discs while tubercles of the choroid may be seen in a certain number of cases.

The diagnosis is established by a lumbar puncture when the fluid will spurt out with great force. The fluid is clear and on standing a cob-web like coagulum forms which is diagnostic. There is leucocytosis and the lymphocyte is the predominating cell. The chlorides are diminished. Tubercle bacilli may be detected in the centrifugalized deposit. The disease may be confused with other forms of meningitis and general diseases such as pneumonia and typhoid fever and the diagnosis is made by a lumbar puncture and examination of the cerebro-spinal fluid. Prognosis is bad. Treatment is symptomatic as the disease is invariably fatal.

Pneumococcal Meningitis.—Meningeal infection is secondary to some infection of the lung, pleura, ear, abdomen or a joint. It may be primary in a small proportion of the cases. The symptoms

are those commonly met with in all forms of meningitis—headache, vomiting, rigidity of the neck and convulsions. There is fever and delirium and the temperature ranges from 103 to 104 degrees. The disease is fatal except in mild cases. Diagnosis is made by doing a lumbar puncture and the fluid is found to be frankly purulent and pneumococci are found in the stained deposit. Pus cells are found in abundance. Treatment consists in attending to the primary seat of the organism if known and administering pneumococcus serum and urotropine. Careful nursing and feeding is essential.

Septic Meningitis.—Streptococci, Staphylococci, Influenza Bacilli and Gonococci may reach the meninges and cause septic meningitis. Infection may spread by way of the blood stream to the meninges from boils on the skin, facial erysipelas, osteomyelitis, middle ear disease and scalp wounds. The onset is sudden with delirium, retraction of the head and vomiting. The temperature is high and ranges from 103 to 104 degress. The cardinal signs of miningitis are present. The diagnosis is established by doing a lumbar puncture and examining the cerebrospinal fluid which is under pressure and purulent in character. The causal organism is detected by staining the fluid. Treatment consists in attending to the original focus and giving an antiserum and repeating the lumbar punctures to relieve the tension. Urotropine should be given in large doses. On the whole the outlook is bad in septic meningitis excepting mild cases.

Syphilitic meningitis.—This condition is due to congenital syphilis. The onset is insidious and the infant normal at first does not take interest in its surroundings and the head drops. The limbs become rigid and convulsions may occur. The cerebrospinal fluid will show a positive Wassermann and a high lymphocytic count. Signs of congenital syphilis may be present and the blood Wassermann will be positive. Prognosis is bad though life may be prolonged. Treatment consists in giving neosalvarsan or one of its substitutes and mercurial inunctions.

Remaining Varieties.—During the course of typhoid fever, meningitis may occur in children as a complication and the cerebrospinal fluid shows lymphocytes and typhoid bacilli. The diagnosis is established by the presence of typhoid fever, the positive Widal test and finding the Eberth's bacillus in the cerebrospinal fluid.

Mumps is a virus infection and meningitis may be caused by the virus of mumps. The symptoms are generally mild and the cerebrospinal fluid shows a relative and absolute lymphocytosis.

Meningitic symptoms are seen from the third to the sixth day of the disease.

In the course of rheumatic fever meningitis may occur and is caused by the streptococcus rheumaticus of Poynto and Payne.

Serous meningitis occurs in association with chronic otitis media and after operations on the mastoid. In these cases the cerebrospinal fluid is under pressure and clear. No organisms can be found in the fluid. Lumbar puncture relieves the symptoms.

Meningism.—Some acute febrile diseases in children are associated with symptoms of meningitis and nothing abnormal can be found in the cerebrospinal fluid in these cases. The name meningism is given to these cases and lumbar puncture not only helps in the diagnosis of these cases but also relieves the symptoms.

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(2) Practice of Medicine—Price, Fourth Edition.
(3) Diseases of Children—Still.
(4) Diseases of Children—Garrad.

WHOOPING COUGH IN CHILDREN

BY

RAI BAHADUR CAPT. SHYAM LAL, B.A., M.B.,

Civil Surgeon, Ballia.

IT is an infectious disease generally occurring in children, characterized in the beginning by inflammatory symptoms of the upper respiratory passages and developing into a peculiar convulsive "whoop" or crowing inspiration towards the end of the second week.

Etiology.—It is a highly communicable disease characterized by catarrhal and nervous symptoms due to some specific organism. The Bordet-Gengou bacillus is being increasingly taken as the cause of the disease. It is found in great numbers in the cilia of the superficial epithelial cells causing local irritation and cough. The contagium is thrown off from the respiratory tract, chiefly in the sputum; the disease appears to be readily communicated through the air for a considerable distance. It is specially contagious in the early catarrhal stage. The majority of cases occur in children under the age of 4 years. Girls seem to be more infected than boys.

Pathology.—In simple cases there is catarrhal inflammation of the nose, pharynx, larynx and trachea. The sputum from 156 children with whooping cough showed the presence of the Bordet-Gengou bacillus in all who had been coughing for 2 weeks.

Symptoms.—Incubation period of the disease is 5 to 13 days. Symptoms are divided into three stages :—

(1) Catarrhal
(2) Paroxysmal and
(3) Stage of decline.

Catarrhal Stage :—In this stage the symptoms are those of a more or less severe coryza. The cough at this period is not characteristic; gradually it becomes paroxysmal and is more troublesome during the night than during the day. There may be slight fever and a dry cough which is not arrested by usual remedies.

Paroxysmal Stage.—This develops towards the end of 2nd or 3rd week. The cough then becomes more violent and paroxysmal and is characterized by the crowing inspiration termed the "whoop". The child fears its on-coming and runs to its mother or nurse for support. The paroxysms generally end with exhaustion with a large quantity of clear, thick and sticky mucus from the throat. Vomiting takes place at the same time. In delicate children and specially in infants, these attacks produce great exhaustion and the little patient falls back with livid face and pulse is more or less uncountable. In mild cases, these paroxysms occur 8 or 10 times and in severe cases 20 or 30 times during the twenty-four hours. The severity also differs in different cases.

Stage of Decline.—This begins when the paroxysms grow less frequent and gradually cease. The disease generally runs a longer and more severe course during the late autumn and winter months than during the spring and summer. The usual duration of the disease is from 2 or 3 weeks to 8 or 10.

Complications and Sequelæ :—

(1) Tracheitis is always present which under exposure readily develops into Bronchitis.
(2) *Bronchopneumonia* :—Sometimes Broncho-pneumonia develops and the case becomes more serious. It is indicated by the sudden rise of temperature and increased difficulty in breathing.
(3) Some emphysema of the lung is generally developed in every serious case.

(4) Vomiting in some cases is a very troublesome complication and interferes with the nutrition of the child. Convulsions generally occur in children.

Among the important sequelæ are emphysema, chronic bronchitis, asthma and chronic interstitial pneumonia.

Prognosis.—The Prognosis in whooping cough depends on the age of the child and on the presence and absence of pulmonary complications. There are more deaths among females than among males. In 90% of the cases, death is due to a complicating pneumonia. In children over 6 years of age, serious complications are rare.

Prophylaxis.—The child should be isolated and kept away from school. Rooms occupied by a case should always be subjected to a prolonged airing and preferably to fumigation. The quarantine should continue until the paroxysmal stage is past.

A vaccine prepared with the Bordet-Gengou bacillus has been employed for prophylactic purposes. Injections of convalescent serum or of whole blood from persons who have had wooping-cough is also an available measure. For exposed children subcutaneous injection of 2 to 5 c.c., of whole blood from persons who had pertussis long before, generally checks the disease.

Treatment.—Patients should breathe pure air. As much time as possible should be spent out of doors. Cold draughts, strong winds, and sudden atmospheric changes are to be avoided. Change of climate chiefly to a warm sea-shore location is chiefly beneficial. Coughing spells are shortened by stretching the neck and lifting the chin.

Local Measures.—Some specialists claim much benefit from the application of 1 to 2% solution of resorcinol to the nasal passages, pharynx, and larynx by means of a brush or spray. The inhalation of an antiseptic vapour has been widely advocated. Creosote is the best but phenol, eucalyptol and thymol are also useful.

Systemic Treatment.—Sedative and antispasmodic medicines may be given internally. Antipyrin is the best of these and may be given in one grain doses to a 6 months infant or in 2 grain doses to a 2 years child. Belladonna has been recommended. Starting with small doses, ½ minim of the Fluid Extract may be used in a child of 2 years every four hours. The dose is slowly increased. Personally, I prefer tincture—Belladonna beginning with 1 drop three times a day and increasing the daily quantity by 1 or

2 drops until the mild physiological effects of the drug appear. Adrenalin solution is also a very good medicine more or less specific. Under 3 years, 2 drops every 3 hours; 2 to 7 years 3 drops; 7 to 15 years, 4 drops; over 15 years, 5 drops, all given after coughing spells. Intramuscular injection of ether also gives very good result.

Recently it has been found that vaccination of the child greatly checks the duration and severity of the child. I had seven children in my house who were attacked with whooping cough. 5 of them, I had got vaccinated and 2 remained without vaccination. In all these 5 who were vaccinated, the disease was greatly modified. So, the children with whooping cough should generally be vaccinated as a treatment for whooping cough.

ACTINO-THERAPY IN PEDIATRICS

BY

CAPT. R. BHATTACHARYA, B.Sc. M.B.,

Radiologist-in-Charge, Chittaranjan Hospital, Calcutta.

"LIGHT" has been recognized from the earliest times to possess healing powers but modern "Scientific Actino-therapy" dates from Finsen's discovery in 1890 of the bactericidal properties of this radiant energy. It was this great Swedish pioneer who thus laid the foundation of modern light treatment derived from both natural and artificial sources. Discoveries and their clinical evaluation have proceeded very fast from that date but Atino-therapy cannot yet be said to have reached a final stage, as "fresh scientific facts, fresh sources of light and fresh indications and contra-indications for its use keep cropping up". Enough facts, figures and clinical experience have accumulated, however, in these intervening years to prove the great importance of light therapy in modern practice which can no longer be ignored by the practical physician. I propose in this paper to review shortly the scope of actino-therapy in the prevention and cure of diseases in children.

The importance of light therapy in pediatrics will be apparent by going through the annual reports of Health departments and Children's Clinics in various European cities during the last few years. Thus, the third annual report of the Scottish deparment of health for 1931 states that out of 532 school children receiving U. V. radiation in 1930—31 for various defects, those suffering from *anaemia and debility* (198) showed marked improvement as

shown by increased activity, better appetite and sounder sleep, the blood test showing concurrent increased Hb. Cases of *rickets* (42) showed very satisfactory results, whilst those treated for *chronic bronchitis* (84) showed improvement in one half of the total number, the *susceptibility to winter cough* being especially lessened in them. The majority of the cases of *enlarged cervical glands* improved.

The senior medical officer, Nottingham, summarising the results of U. V. treatment amongst 17,237, attendances of school children in his annual report for 1931, emphasises on the great utility of this treatment in every field of pediatrics. Often, it is just what is needed to bring back good health to many children after an acute illness, whilst others seem to require a course from time to time to maintain moderately good health. It has a marvellous effect in relieving old standing conditions like *enuresis*.

Dr. W. Benton, school medical officer, Eastham, states in his annual report to the Education Committee for 1931 that "the daily use of the artificial light apparatus would be a great asset in our endeavours towards the prevention of ill-health and diseases in early life". The number of children treated by him in Eastham Light Clinic in 1931 was 312, the commonest complaint being *debility* alone, or complicated with anæmia, bronchial catarrh etc.,

Dr. A. G. H. Severn, medical officer of health and school medical officer, Pontypridd, states in his annual report for 1931 that ultraviolet radiation has caused a satisfactory increase in weight and improvement in general health in all those children who were below standard.

Instances and reports like these can be cited from almost all European centres where there are well organised public health departments and school medical service. We have not any such state or municipal organized light clinics in this country for mass irradiation of children from the point of view of "Child Welfare" or "Preventive Medicine", but from the experience gained from private cases, the writer can endorse every word of the above extracts.

Nature, Production and Properties of Ultra-Violet Rays

A brief discussion under these headings is necessary to elucidate the subject matter of this paper. I have touched upon these points already in my previous communications(1), (2) and here I am summarising the main facts according to the latest researches.

Ultraviolet rays constitute that part of the electro-magnetic spectrum which extends beyond the visible violet and are themselves not perceived by the human eye, as their wave-lengths are too short to excite the retina. They are emitted from very hot bodies and are present in abundance in natural sunlight. Artificially, they can be easily generated by striking an electric arc between two separated electrodes, when the high temperature thus evolved ionises the intervening layer of gas and emits the radiations within the range required in therapeutics. The carbon arc lamp and the enclosed mercury vapour arc lamps are common artificial generators of these rays. The wave-lengths of the whole U. V. region covers roughly a range from about 75 to 4000 Angstrom Units (A. U.), The shortest waves in this range do not reach the earth from the sun, as the atmosphere absorbs all those below 2800 A. U. The wave-lengths which concern us in practical therapeutics range from 2000 to 4000 A. U. Of these, the shorter waves between 2480 and 2960 A. U. have the strongest bactericidal but the least penetrating power and so are chiefly used for their local action. The longer waves upto 3900 A. U. have the greatest penetrating power through the human skin and are regarded as most valuable for their constitutional and tonic effects. These effects are easily obtained by exposing the bare skin of the patient to the rays obtained from any of the artificial Ultra Violet generators according to a proper dosage.

The first effect noticed after such a general irradiation is an *erythema* of the exposed skin which appears after a latent period of 1 to 8 hours. It reaches its maximum in 8 to 24 hours and then slowly subsides. The intensity of this erythema naturally depends on the total dosage received by the skin and may vary from a mild hardly perceived redness to an intense inflammatory dermatitis with vesicles and blisters. The inflammatory cellular products may get absorbed in the latter case and produce a severe constitutional disturbance of the nature of a non-specific protein shock. The more important skin reaction is however manifested in the walls of the skin cells which become quite permeable by the stimulus of the actinic rays, so that extraneous substance (*e.g.*, tyrosin and other aminoacids) readily enter from outside into the capillary blood stream([3]). A pronounced erythema is followed by desquamation. Repeated exposures produce pigmentation of the skin due to deposition of melanin caps on the epithelial and basal cells of the epidermis. The function of this pigment is still a disputed point. They may exert a protective action from the ill-

effects of an overdosage, but it is quite certain that the repetition of the erythema reaction avoiding pigmentation produces best results in general irradiation([4]).

We have now to consider the effect of U. V. rays on the Ca and P metabolism in the blood, as it is this action which is of the greatest importance in pediatrics and which alone enables us to understand the indications of this invaluable agent in most of the diseases of children. It is quite within common knowledge that the human skin contains in its outer layers an appreciable amount of various sterols. Of these ergosterol is considered by modern authorities as nothing but a *pro-vitamin.* This pro-vitamin is converted into vitamin D by the action of U. V. rays and as the activated cells become permeable by the same agency, the vitamin readily enters the capillary network and thus gets into the circulation. The role of this vitamin in revitalising the organism of the growing city child cannot be over-estimated. It can be taken as an axiomatic truth that almost all children of our smoke-laden overcrowded modern cities are suffering from more or less degree of *avitaminosis.* This leads to a perceptible diminution of the calcium and phosphorus content of the blood, which, if carried to excess, leads into the true clinical picture of florid rickets. The calcium content of normal serum should be about 10 mgm. and P about 6 mgm. per 100 c.c., of blood. These may fall as low as 1 mgm. per 100 c.c., in florid rickets. U. V. radiation brings about a rapid increase of both these elements in rickets by supplying the missing vitamin D. The role played by the latter in bringing about this result was a controvertible point till quite lately. It was formerly supposed that the vitamin acted by stimulating the parathyroid gland. Harris has definitely shown however that vitamin D acts by permitting a net increased absorption of Ca and P from the bowels so that the level of these elements in the blood rises([5]). Parathyroid stimulation also increases the serum calcium, but the element is extracted in this case from the bones. Thus, in diseases attended by hyperplasia of the parathyroids, the excess of parathormone produces softening, disorganisation and cystic cavities in the bones, the condition being recognised as a distinct clinical entity known as *osteitis fibrocystica.* It will be noted however that both in hypervitaminosis and hyperparathyroidism the excess of calcium may be deposited in distant organs, especially in the urinary passages, producing renal calculi or other manifestations of metastatic calcinosis.

The indirect effects of U. V. irradiation manifested in the

blood are also important clinically. The chief of these are a regeneration of red blood cells and their Hb content (the latter after continued treatment only), well marked leucocytosis, a rise in the bactericidal property and decrease in blood sugar. The oxidising metabolic processes are stimulated at the same time and the endocrine system as a whole is brought to a greater activity. As a result of all these effects, a peevish, fretful, vicious child becomes playful, healthy and cheerful, his colour improves, his appetite improves, he sleeps better, gains in weight and is better able to resist the onset of infections. To the uninitiated all these claims may appear to be exaggerated, as they appear to be too wide for one particular therapeutic agent, but the opinions and extracts quoted in the early part of this paper as well as the clinical experience of those who have done scientific actino-therapy, will endorse every word of the above possibilities.

We will now pass on to the clinical aspect of our subject.

Ultra-violet Radiation in Antenatal Life

On account of the absence of a rational domestic hygiene, multifarious house-hold duties with little or no rest, improper or insufficient food and light starvation due to our pernicious purdah system, the chances of our young expectant motherhood are lower than that of other civilised countries. Our young expectant mothers are generally lethargic and low spirited, restless at night, often subjects of insomnia and frequently suffer from excessive vomiting. All these complaints can be averted or removed by judicious irradiation by Ultra Violet rays, provided, of course, the hygienic and dietetic errors are rectified at the same time. The beneficial effect of irradiation in excessive vomiting is especially stressed by Gibbs ([6]). The irradiation is also helpful to the budding child in the womb, as the treatment ensures an abundant supply of breast milk rich in anti-rachitic factors to the child after it is born, thus ensuring its immunity from rickets, defective dentition and other manifold ills incident to artificial feeding([7]). The maternal irradiation should be continued at the period of lactation with profit both to the nursing mother and the child.

Ultra-violet Rays in Preventive Medicine and Child Welfare

The disastrous results of light starvation is quite apparent in the dirty, narrow, ill-lighted slums of our big cities where the sallow-complexioned, pot-bellied, rickety children with thin limbs will strike the attention of any casual observer. The economic

hardships of modern times, combined with overwork, overcrowding, under-feeding and unhygienic mode of life add their own quota to the light starvation mentioned above and are sapping the vitality of our budding industrial population. The great deleterious effect of light starvation will be apparent from the fact that rural children, though suffering from the same or perhaps worse economic distress, are as a rule, more able to withstand adverse circumstances or the ravages of disease. The children of our urban, middle or even better class are no better off. On account of the under-nourishment or overwork of our young mothers in the joint-family system, these children get a bad start in life. Very frequently they are deprived of their mother's milk in infancy, and in their childhood do not get that greatest beneficial food of early life—pure unadulterated cow's milk—in enough quantity. Combine with this the light starvation of overcrowded dwelling houses or flats in dingy, narrow lanes with no open ground to play about and you get the full picture of ill-developed, emaciated, puny morsels of humanity with defective dentition, bowel disorders, nervous irritability, respiratory catarrh and all other manifestations of lime starvation, finally culminating in many instances in full fledged rickets, tetany or tuberculosis. It is in these classes of children that Ultra Violet radiation produces results which is nothing short of marvellous. All the disorders mentioned above disappear quickly, the children become brighter, more vigourous and contented, they eat and sleep better and the whole outlook changes in an incredibly short space of time, so that the puny, miserable specimen of humanity, getting thereby just the missing start, develops into a fine, healthy and spirited child with good chances of combating the ravages of illness or other adverse circumstances.

Ormsby in evaluating U. V. R. in child welfare work, points out the following clinical types as particularly amenable to this treatment([8]):—

"(1) The fretful undersized infant who fails to make headway.

(2) The flabby, older baby suffering from frequent colds and bronchitis, delayed dentition, poor muscular tone, irregularity of the bowels, nervous instability and enlarged tonsils and adenoids.

(3) The child (often an only child) who is faddy over food and eats too little, is irritable, timid and sleeps badly.

(4) The rheumatic type of child, intelligent and nervous, very susceptible to changes in the weather and to fatigue or excitement in any form. Often complaining of pains in the limbs, etc.

(5) The child with tubercular glands, overactive, failing to gain weight and make headway".

J. Saidman also states in his book on ultraviolet therapy that premature and debilitated infants make excellent progress under actino-therapy with steady gain in weight.

I will close this section with a few words about the prevention of dental caries and tuberculosis.

Dental caries.—It is an established fact in modern bio-chemistry that vitamin D produces calcification in bones and teeth and its deficiency leads to defective dental tissue. As a matter of fact, "Ricket and defective formation of the teeth are concurrent". We have already seen how Ultra Violet irradiation of the skin activates the ergosterol present there, converting it into vitamin D which, getting into the circulation, increases the Ca and P content of the blood by promoting the net absorption of these elements from the bowels. It is thus apparent why irradiation of the pregnant mother will ensure proper calcification of the infant's teeth. Children already suffering from defective teeth or actual dental caries will also be greatly benifited by a course of such treatment. This will have an excellent effect on the lesions themselves (Luckiesh and Pacini) and will also enable the defective teeth to acquire better powers of resistance. It is of course of utmost importance to provide enough Ca or P in the food by prescribing a suitable dietary in which milk holds the premier place.

Pretubercular conditions.—The power of Ultra Violet rays to increase the resistance of the body against the onset of disease renders this agent a valuable prophylactic measure in preventing the development of tuberculosis in children, after pleurisy, pnuemonia, repeated attacks of influenza and also of tubercular "contacts". Brunthaler obtained splendid results in preventing its onset in tuberculous contact children and as a result of his experiments, a large scale irradiation of all contact children in his town is in contemplation(9).

Ultra-violet Rays in the Treatment of Some Diseases in Children

Anæmia, debility and malnutrition.—The blood regenerating function of Ultra Violet rays will directly explain the beneficial results

of this treatment in simple anæmias of children when a considerable increase in the red corpuscles and the hæmoglobin takes place. Infantile anæmia caused by toxæmic conditions, however, only respond if the underlying cause can be determined and removed. The treatment causes the lack of energy and appetite, sleeplessness, irritability and other manifestations of a deficient hæmoglobin content in the blood to disappear quickly, altering the whole aspect of the case in a short time. Many of these cases however present a medley of concurrent pathological conditions in other organs which a single agent is unable to rectify, but, on the whole, the majority, even under such unfavourable circumstances, will show an improvement which was previously unobtained by the traditional methods of treatment. Children suffering from *malnutrition*, with disproportionately large head, sunken chest, protruding abdomen, dry skin, flabby muscles and cold extremities, all signs of defective nutrition and light starvation, also improve remarkably after a short course of this treatment. The beneficial results in all these cases are believed to be caused by the improved quality of the blood, better endocrine balance and metabolic efficiency brought about by the irradiation.

Nervous states.—Ultraviolet rays are a very efficient agent for the treatment of the nervous child on account of the stability of the nervous system which the agent brings about. These children become less irritable, more social and congenial to their companions, less afraid to go in the dark, more alert in their work and more active. The simultaneous improvements in the colour, appetite, muscle, tone and sleep of such irradiated children are very pleasing to the parents and the doctor. Better home hygiene, good food, open air and plenty of sunlight are essential adjuvants. Dull backward children can also be irradiated with profit, as the mental state is likely to be much improved, this being a part of the general improvement.

Respiratory diseases.—The treatment of *septic tonsils and throat* by Ultra Violet Rays has given excellent results in my hands. Recurrent types of tonsillitis and pharyngitis with little tendency to suppuration improve most. Such tonsillar infection, if left untreated, may lead to rheumatic and other infections. I irradiate the tonsils and the fauces by introducing quartz rods inside the mouth, by which means the rays can be accurately directed on the affected parts in concentration. This is followed by a general irradiation of the whole body. Not only does the local trouble and its tendency to recurrence entirely disappear but the improvement in

general health is also well marked. The fibrotic or hypertrophic tonsils are however better removed by operation before resorting to irradiation.

The same beneficial results are also obtained in debilitated children subjected to repeated attacks of *nasal catarrh or bronchitis*. The rays presumably act in these cases by increasing the power of resistance. These recurrent attacks of cold are often very baffling to the physician and I have been able in innumerable instances to keep the child free from these attacks for years together by a single course of Ultra Violet Rays where the previous administration of vaccine, local measures and general treatment all failed. Cases of chronic bronchitis, bronchiectasis and asthma may also be given a trial in association with the usual treatment, some of which respond very well.

Tuberculosis.—I have already dealt elaborately with this disease in the previous paper referred to already(2). Cases of tuberculous adenitis, tuberculosis of bones and joints and abdominal tuberculosis show such marked improvement under Ultra Violet Rays, that it may almost be considered to be a specific in these conditions. This opinion is shared by actinotherapists all over the world. Pulmonary tuberculosis however presents a different problem. Here Ultra Violet Rays cannot claim to have any specific effect. Whatever improvement is caused is brought about by the indirect means of increasing the power of resistance and it is obvious that the beneficial results entirely depend on the capacity of the body to react. It is thus of no use if the patient is very weak, toxæmic or running a hectic temperature. It should not be used in advanced cases nor in miliary affections. It may be of great help in the initial stages and in every instance, careful selection of cases, cautious dosage and close observation of results are essential.

Simple adenitis.—Actinotherapy is very useful in non-tuberculous cervical adenitis, the care of the local condition, if any, being undertaken at the same time.

Rickets.—Ultraviolet rays have earned the distinction of a true specific in this disease. The prophylactic action obtained by irradiating the expectant and the nursing mother has already been touched upon. The curative action in florid rickets is equally well marked. Dr. K. Huldschinsky of Berlin and Dr. Hess of New York are pioneers in this field. The splendid results obtained by these workers and their conclusions have been amply corroborated by later day clinical experience. Irradiation is quickly followed by

marked symptomatic improvements which can be proved to be due to actual healing of the lesions by radiography. After a course of treatment is over, the process of recovery continues for at least two months more. The most effective wave-lengths for this purpose are in the region of 3000 A. U.

Mention must also be made in this connection of an alternative form of treatment in which the effect of the irradiation is sought to be obtained by the administration of irradiated foodstuffs (chiefly milk) and irradiated ergosterol containing a definite amount of vitamin D. In Germany and Austria this indirect heliotherapy is regarded as equivalent to direct irradiation, but most actinotherapists hold that though the clinical results obtained after administration of the irradiated products are good, they cannot be compared with direct irradiation. Latest observations have also sounded a note of warning in administration of irradiated products, as overdosage of these may lead to "hypervitaminosis" characterised clinically by bone decalcification and metastatic calcinosis, whereas on account of the protective function of skin pigments produced by excessive direct irradiation, such danger is practically absent in the latter case. L. G. Parsons recommends Ultraviolet rays in cœliac rikets which he considers to be completely curable by a course of this treament. The only case of renal rickets which came under my observation did not respond at all.

Chorea.—Most actinotherapists have obtained satisfactory results in this disease by general irradiation. Furniss recommends small doses to begin with and advises stoppage of the treatment if there is an increase in the pulse rate or restlessness. But it is worthy of a trial in every case, as fair resutls may be expected in an otherwise very intractable and distressing complaint.

Convulsive States.—Under this heading is considered *tetany* and other cases of milder muscular irritability caused by minor parathyroid insufficiency. Many authorities consider that the latter condition is quite a common occurrence and is more prevalent than full fledged tetany. It is manifested clinically by coarse tremor, facial twitchings, muscular pain and mental depression. The blood shows marked hypocalcæmia due probably to parathormone deficiency. All these cases respond splendidly to ultra violet therapy and better results are obtained if the irradiation is combined with administration of calcium and parathyroid gland.

Whooping Cough.—Ultra violet therapy is a very efficient adjuvant in the management of this disease. All actinotherapists,

prominent amongst whom may be mentioned Schott, Russell, McCaw, Bru, Furniss and Turner agree that general irradiation in this complaint is followed by a great improvement in the patient's constitutional condition with increased appetite and better sleep, whereas the paroxysms become less and less severe, the vomiting disappears, and there is a marked shortening in the period of illness. Furniss compares the results of this treatment with that obtained by ephedrine and considers that both exert their beneficial action by their effect on the sympathetic nervous system. Both Furniss and Russell advise simultaneous application of X-rays to the neck and upper part of the chest.

Convalescence.—Ultra violet light is the most useful body building tonic in children after a severe illness, *e.g.*, the infectious fevers, respiratory affections and post-operative conditions. Especial mention must be made of measles, whooping cough, diphtheria, post-diphtheritic paralysis, influenza and broncho-pneumonia. In every one of these cases the ultimate recovery will be speedier and more complete.

Adjuvants to Actinotherapy

Though actinotherapy, by itself, is capable of doing much good, yet in the majority of diseased conditions dealt with in the preceding sections much better results can be obtained by the institution of suitable accessory measures, the chief of which are the following :—

Sunlight and open air.—These are two essential requirements in the development of healthy childhood as well as in the treatment of those who are weak and debilitated. Better results are always obtained during ultra violet treatment of such children if they are simultaneously allowed free access to sunlight in the open air. This combination is very valuable in the management of surgical tuberculosis.

Hydrotherapy.—The beneficial effects of graduated sea bathing in body building have been well recognised in Western countries. This practice is also valuable in diseased conditions like surgical tuberculosis and the combined helio and artificial actinotherapy have been instituted in many European centres for such diseases. Cold baths, especially administered as a needle spray, form a valuable measure after ultraviolet ray treatment, enhancing the tonic and stimulating effects of the irradiation.

Codliver oil.—This is a valuable agent during actinotherapy in the treatment of rickets and other forms of calcium deficiency.

Small doses are adequate, and if the raw oil upsets the stomach or the bowels, one of the many excellent emulsions now available in the market may be substituted in its place.

Milk.—Natural milk, containing about 10 grains of calcium to the pint is a most valuable food for children and growing adolescents. Though it is becoming incresingly difficult to secure it in adequate quantities in our big cities in an unadulterated condition, more efforts should be made to get such supply. For children undergoing actinotherapy it is a most indispensable adjunct and every attempt should be made to administer a pint of this daily to such patients.

Medicinal and Dietetic preparations.—Many excellent dietetic preparations are available in the market with a calcium or Ca and P base and such products, re-inforced with vitamins are recent additions. The latter class include specialities containing activated ergosterol (Vitamin D.) alone or with vitamins A and B added. These products can be used with advantage in children undergoing light treatment, especially in those cases where a sufficient supply of milk is difficult to secure, care being taken to avoid excessive dosage to guard against the possibility of producing hypervitaminosis.

Home hygiene—Avoidance of overcrowding, late hours, lack of sleep, exciting events and irregular and hurried meals should be avoided in the home as far as possible. Sunlight and open air have been stressed upon many times already. Overloading the child's stomach with unsuitable food or eating of too much sweets at odd hours are frequent errors in many homes and must be guarded against. Children of the better class are often overloaded with clothing; it must be emphasised to the parents of such children that exposure of the bare skin to the sun and air in good weather is a necessary measure for ensuring better health.

I hope I have been able to convince my readers of the great importance of ultra violet rays in the prevention and treatment of diseases of children. I have not touched upon the problems of technique in this paper but this may be the subject matter of a supplementary contribution if occasion demands it. This subject is, however, of the greatest importance and any body who wants to practise actinotherapy must thoroughly understand the principles of dosage, must be able to measure and standardise the output of his lamp and must be able to produce the required degree of reaction in every case. This is what I mean by " Scientific Actinotherapy ", which, if carried out in the proper way and with proper

attention to the diagnosis and the associated general and hygienic treatment, will provide a powerful therapeutic agent in the hands of the clinician, capable of doing untold good to our budding generation and to the community at large.

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SKIN DISEASES OF INFANCY

BY

DR. D. R. PREM, M.R.C.S. (ENG.), L.R.C.P., (LOND.),

National Medical College, Bombay.

THERE is not much to distinguish skin diseases of an infant from those of an adult. But there are a few points of importance, which warrant the consideration of the subject separately.

The most important point is about the causes of skin diseases, particularly heredity. Heredity plays a great part in the causation of skin diseases, especially in the two subgroups, (1) Chronic infection, as syphilis (2) allergy, the important manifestations of which are eczema, urticaria and angio-neurotic œdema. These hereditary conditions, and others like hemophilia, give rise to manifestations mostly in infancy. And that is why they claim special study in the case of infants.

The second point is about treatment. In many infants it is very difficult to carry out the elaborate methods of treatment,

which are prescribed in the case of adults. Here too we have to devise special means to carry out the treatment.

The diseases of infancy can be grouped, apart from their being hereditary or otherwise, under three heads: (1) Infection (2) allergy (3) newgrowths. It will be apt to say here that in infancy acute infections and new growths are common.

Among infections, congenital syphilis is the most important. Congenital syphilis may show itself in the newborn at different periods of its age. This depends on the time elapsed between the infection of the parents and the birth of the child, and also on the fact whether and when they took any treatment. Generally it manifests itself within the first three months of the child's age, and will never be later than six months.

The skin eruptions can be grouped as follows :—

(1) *Erythematous*—the roseolar syphilides, met with in acquired form, are rare in infants. The most common form is red patches over the buttocks and round the anus. They may even extend to the posterior and inner aspects of the legs, and to the loins.

(2) *Mucous tubercles*—occurring in warm and moist situations, such as groins, axillae, toes, anus, angles of the mouth.

(3) *Papular*—The papular, red coloured and scaly eruption is also very common and begins on the buttocks. It then extends to the whole body.

(4) *Vesicular and Bullous*—Vesicular are less common and Bullous ones more common in congenital than in acquired form. Later on they may become pustular. The bullous form is called 'Syphilitic pemphigus'. It appears in the first week of life or the child may be born with it. The favourite sites are palms and soles.

The distribution of the eruption on palms and soles, while the trunk is free, their appearance in the first week of life and marked wasting will easily differentiate these from ordinary pemphigus. Prognosis in these cases is bad.

Treatment—Mercury and arsenic are the chief drugs used. Mercury can be given in two ways; by mouth as grey powder and by inunction as an ointment. Either ung. Hydrarg or Calomel ointment may be used for the purpose. Some physicians use *Mercuriol*, an amalgam with tin and aluminium.

Arsenic is best given as sulpharsenol intramuscularly.

Out of the acute infections mention need be made only of Impetigo contagiosa, Pemphigus neonatorum, Boils, Scabies and vaccination rashes.

Scabies.—This is so wellknown a condition, that it needs very little to be said about it. Infection in infants is carried by the infected mothers. And hence those parts suffer most, which come most in contact with the mother's hands, namely face, scalp, hips and feet. Because acute inflammation sets up easily in children, pustulation is more common and extensive. Treatment is the same as for adults, namely ung. sulphuris, with or without Balsam Peru, and Mitigal. It should not be forgotten that the mother should also be treated simultaneously with the child.

Impetigo contagiosa.—A vesicular pustular affection caused by streptococcus. The contents of the vesicle dry up and form the wellknown golden coloured scabs. The infection is carried by finger nails during the act of scratching. Predisposing factors are run down conditions and irritants, giving rise to itching, such as oral, nasal and aural secretions, lice etc. Common situations are round the ear, nose, mouth and occiput.

In the epidemic form of the disease, the cocci reach circulation also, and hence the eruptions appear over the whole body with mild febrile symptoms. This form runs a course of about two weeks.

Occasionally the lesion may be larger than a vesicle and then it goes under the name 'Impetigo contagiosa Bullosa'.

Sometimes it becomes difficult to diagnose this condition from Infantile Eczema of face. Discrete lesions, asymmetrical, with golden yellow crusts and without much erythema are the points in favour of Impetigo. In not a few cases one may be complicated by the other.

Treatment.—Give bath with a little powdered bark of oak. The scales can be removed by warm olive oil compresses or starch poultice. The raw surface can be smeared with ung. Hydrarg Ammoniata 2.5% or ung. Dyacilon. Internally Iodipin, Iodalban can be tried. For resistant cases Strepto-coccal Vaccine or immunogens can be tried.

Staphylo-coccal infections.—It may manifest itself in three forms, Boils, Impetigo of Bockhart and Pemphigus neonatorum.

Pemphigus Neonatorum.—This is very important in the new born. In fact, it is only the bullous type of Impetigo cantagiosa. It begins in the first or second week of life, favourite positions

being thighs, buttocks and pubes. The contents are mostly pellucid, in only a few cases seropurulent or purulent.

P. Manson has described a diffuse variety, and called it Pemphigus contagiosus Tropicus. This is more common in Tropics and more fatal.

Treatment.—The same as for I. Contagiosa. Impetigo of Bockhart and boils are both infections of the hairfollicles. The latter is deep seated and more virulent, while the former is superficial and less virulent. They are easy to diagnose, but not so easy to treat. Treatment can be divided into three.—Local, oral and parenteral. Locally, a boil may be aborted if carbolic acid is injected in its base. Solutions of Hydrarg perchlor or acid flavin,ung. Hydrarg or stannoxyl liquid may be used for local application. By mouth, collosol manganese, Collosol Iodine, stannoxyl or tinnoxyl tablets and iron preparations can be given. For injections, stannoxyl, Staphylococcus aureus vaccine, collosol manganese or milk preparations like abijon, aolan, lactumen etc., can be used. I have obtained good results with milk and patient's own blood. For infants, mother's milk can be injected intramuscularly.

Vaccination Rashes.—Sometimes, in a very small percentage of the children vaccinated, we see various kinds of eruptions. These are sometimes startling, that is why a mention of them here. These eruptions can be classified as under:—

(1) Eruptions which result from vaccination such as generalised vaccinia, diffuse erythema, vaccine lichen, secondary accidental vaccination.

(2) Due to introduction of other infection either with vaccination or after some days, as syphilis, erysipelas, Impetigo contagiosa and furunculosis.

As regards generalised eruptions it may be said that diseases like roscola, urticaria, eczema, psoriasis, Dermatitis Herpetiformis and a few more may come, for the first time, or recur after vaccination. Of course, in these cases the vaccine excites these diseases in susceptible persons, just as any other cause might do.

Now I shall take up the second group, namely allergy. Von Pirquet, the originator of this term, meant by it 'altered or exalted reaction of the body to certain substances'. But this meaning was very incomplete. Bloch improved on this definition and defined allergy as property of certain cells or organs to react in a specific manner, when brought in contact with a substance

foreign to them. These foreign substances are generally proteins, but may be non-proteins also. They may be exogenous, when they reach the system from outside, *via.*, mucous membranes or skin; endogenous, when they are manufactured in the system itself.

The susceptibility of certain groups of cells in certain persons is mostly hereditary. In some, of course, the hereditary effect is so strong that it manifests itself in early childhood ; in others it is so weak, that it needs favourable circumstances to make its appearance.

The skin manifestations of allergy are three—eczema, urticaria and angio-neurotic œdema; the difference being that in eczema the epidermis suffers, in urticaria, the cutis vera and in angioneurotic œdema, the subcutaneous tissue.

About urticaria there is nothing to be said especially for infants, except a few words about urticaria pigmentosa, which is a disease of infancy. It appears in the first six months of life and is more abundant on the neck and trunk. Sometimes it may affect the mucous membrane of mouth and pharynx. It differs from the ordinary variety in that the wheals are of yellowish colour. When they disappear, they may leave brownish pigmented area.

Eczema in infants affects, generally, the face and the scalp. It generally comes on in the first year of life. In the beginning we get only reddish spot, on which soon appear some papules. These may desquamate or may turn into weeping eczema. Itching is always severe. Due to scratching with nails secondary infection is common.

Treatment.—Infantile eczema is very resistant to treatment. When treatment is begun, care should be taken to see that they do not scratch. If need be their hands may even be tied. Allergic patients bear carbohydrates well, but not proteins. But if seborrhœa is present, then carbohydrates are ill-tolerated.

For local application 3% crude coaltar with zinc paste is the best preparation.

In some cases desensitisation works wonder. And in these cases either milk preparation or mother's blood can be injected.

PRE-NATAL AND POST-NATAL CARE OF CHILDREN'S MOUTH AND TEETH

BY

DR. J. J. MODI, F.M. & S., L.D.S., (ENG)., F.I.C.D.,

Professor of Dental Surgery, Grant Medical College; Hon. Dental Surgeon., J. J. Hospital, Bombay.

To say that every child is or ought to be born healthy is to repeat a truism. It is also a truism to say that the health of the child depends upon the health of the expectant mother, and that her health can be only as good as her mouth. It is a common experience of medical men and dental surgeons to come across women with ruined mouths and ruined health as a result of pregnancy. The cause of the ruined health lies in the deficiency of calcium salts and necessary vitamins in the diet during the period. The cause of the ruined mouths lies in some wrong beliefs prevalent among women. They are :—

(1) That the treatment done during pregnancy to mothers' teeth and mouth will injure or disfigure the baby.

(2) That it is natural for mothers to suffer dental troubles during pregnancy.

(3) That any dental treatment taken during that period will cause miscarriage or abortion.

That these beliefs are entirely wrong must be well impressed by medical men on their patients. They may be assured that if the ordinary rules of oral hygiene are observed, and proper attention is paid to the diet during this delicate period, there is no reason at all why they should suffer from dental troubles. They may also be assured that no amount and no kind of treatment if well done during this period will hurt or disfigure the foetus or cause abortion.

Development of Teeth

Since development of teeth starts in intrauterine life it is natural that all the materials required for their development must be drawn from the mother, and unless that loss is immediately made good to the mother through her diet she suffers from dental troubles and her general health also suffers. Ill health of the mother in its turn will cause the mal-development of the teeth and mouth, and general ill-health of the baby. To enable the

mother to efficiently supply the wants of the developing fœtus, she must be given ample and well balanced diet, and fair amount of exercise in fresh air during the period of pregnancy. Her mouth must be kept in scrupulously clean condition, and any dental trouble present must be promptly treated. Given the well balanced diet, plenty of fresh air, judicious amount of exercise, and healthy oral conditions during the period of pregnancy, the mother may be assured of a normal delivery and birth of a healthy child.

Post-Natal Care

It is or it ought to be the ambition of every mother to bring up the child on her own milk, for the mother's milk is the best diet that the child can be reared on. To enable the mothers to realise that ambition she must have good well balanced diet, plenty of fresh air, and clean condition of the mouth during the period of lactation. Healthy condition of her mouth is very essential because sepsis from mother's mouth is often noticed to have passed to the baby through her milk. Besides containing all the elements necessary for a developing baby, mother's milk gives certain amount of immunity to the baby against certain diseases peculiar to that age, and helps in the efficient development of the mouth cavity. After every feed and especially the last feed in the night, the baby's mouth must be thoroughly cleaned and rubbed by means of a coarse piece of cloth and clean water or if need be with glycerine and borax. This will help in the development of the mouth cavity, and also of the general constitution. Failing mother's milk, recourse must be taken to cow's or buffaloe's milk and not to patent foods as is usually done. These foods contain nothing that the human body can build on. Medical men may be advised to avoid these foods.

Teething

Given wholesome food and environments the child grows up and at the age of about 7th month begins cutting the first tooth of the deciduous set, *i.e.*, process of teething starts. Here it will not be amiss to caution the reader against the tendency of medical men to attribute certain infantile disorders such as cough, diarrhœa, whooping cough, high temperature, convulsions etc., peculiar to this age to this process of teething which it must be remembered is a physiological process. These diseases generally occurring at this time and which are really the pathological sequence of unbalanced or contaminated diet of the mother or the

baby or of the sepsis from the mother's or baby's mouths, are often mistaken as the physiological sequence of this physiological process of teething. As one of the critical periods of life it entails a certain amount of disturbance in the human system, but it certainly is not responsible for these pathological conditions. As it is the extraneous causes occurring at the time of teething that are responsible for these conditions, the medical men may be advised to deligently search for these causes instead of light heartedly attributing these conditions to this physiological process.

What does teething indicate?—It is Nature's indication to the mother to incorporate some solids in the hitherto liquid diet of the infant. These solids must be given as solids in the form of crisp toasted bread or rusks, and apple or orange slices and not soaked in milk or soup as is usually done by mothers. Solids given in real solid form help the development of the jaws and teeth, and also improve the digestion of the baby. As the child grows on, more teeth of the deciduous teeth appear and the whole set (20 teeth) is completed by 2½ years. As each tooth of this set has to last out the certain span of life assigned to it by Nature, it is essential that scrupulous care must be taken of these teeth, so that their premature loss may be avoided. From the very early beginning of this set the teeth must be cleaned with coarse cloth and clean water, and later on with fairly hard tooth brush, fairly gritty chalk-powder flavoured with any essential oil and rose oil. Besides being essential for the immediate welfare of the infant, they help in the full and orderly development of the jaws and the teeth of the second set.

The reader must have noted that I have advisedly used the word 'deciduous' and avoided the term temporary for the teeth of the 1st set. The term temporary is a misnomer. Being misguided by the term temporary the lay public and even the medical men are inclined to think that since they are only temporary they can be left uncared for and that no energy or money should be spent for their treatment. It is certainly a very wrong belief and the medical men may be well advised to strongly discourage it, because as said above on the welfare of this set depends the immediate and future welfare of the child.

Sixth year

Given due care of the deciduous teeth, and well balanced and nutritious diet the child develops normally and at the age of about sixth year, the stage is well set for the normal appearance of the

first, the biggest, the strongest and the most important tooth of the second *i.e.*, permanent set. As this tooth appears at this early age it is generally mistaken for a deciduous tooth and so left uncared for and allowed to decay, for decay which is usually rampant at this stage is supposed by people to be Nature's way of shedding the deciduous teeth. By the virtue of its position, and its formation this tooth is very prone to decay that in over 80 p. c. of children these teeth are either entirely lost or hopelessly decayed before they reach the age of 12 years. The tragedy of the premature loss of this biggest, strongest, and the most important tooth of the permanent set at such an early age can better be imagined than described. After the eruption of this tooth, as the child grows up, different groups of teeth erupt at certain times till the whole of the permanent set is complete at about 18-25 years. Since as the term implies they are permanent and have to last through the life of the owner, proper prophylaxis must be employed to preserve them.

Dental Prophylaxis

Every day a dental surgeon is asked the question "what should be done to keep the mouth and teeth clean?" and I am sure this question is uppermost in the minds of the readers. As said above dental prophylaxis must start with intra-uterine life and continued as given below all through the life time. I give this in short as under :—

Pre-natal stage :—

(1) Give wholesome well balanced diet containing proper amount of calcium and phosphorus to the expectant mother during the period of pregnancy.

(2) She must be given judicious amount of exercise in open air.

(3) She must be made to keep the teeth and mouth scrupulously clean, and made to take the treatment in case she needs it. Cleaning last thing at night just before going to bed must be strictly enjoined.

Post-natal stage—From birth to 6th year :—

(1) The baby must whenever possible be fed on mother's milk, and the mouth must be cleaned with coarse cloth and water after every feed. During the process of cleaning a certain amount of friction (massage) must be applied to the gums and mucous membrane to draw more circulation to the mouth cavity.

(2) The teeth of the 1st set may be cleaned by the mother

in the beginning with coarse cloth and clean water, but later on a tooth-brush and powder may be used. Gradually the child may be instructed in the use of the brush twice a day morning and night.

(3) The child may be given wholesome well balanced diet consisting of milk, eggs, meat, green vegetables, and fruits; and judicious amount of exercise in open air and sunlight.

(4) The child must be taken to a dental surgeon for periodical examination, and treatment must be done when necessary.

(5) The child must be trained to breathe through the nose and if there is some obstruction to it, have it immediately removed.

(6) Food must be given in such solid form as would exercise the muscles of mastication.

Sixth year and after :—

(1) Diet must contain more solids than hitherto and must be well balanced and mixed.

(2) The patient may be advised to clean his teeth twice a day, morning and night by means of a hard tooth-brush, fairly gritty chalk powder flavoured with some essential oil, and clean water.

(3) Habitual use of antiseptic mouth washes and powders must be discouraged.

Caries and Pyorrhœa Alveolaris

The present day most accepted theory of caries is that food particles left in the mouth when acted upon by acid forming micro-organisms produce acids. They, coming in contact with the enamel of the teeth dissolve it out and so cause caries. The theory of Pyorrhœa is that tartar and food stuff accumulating on and in between the teeth and under the free margin of the gums, irritate and subsequently inflame the gums. This inflammation due to the action of pus-forming germs, breakes down into suppuration and so causes Pyorrhœa. Several times, dental surgeons have come across cases that falsify these theories. It is often found that very clean mouths are full of rampant caries and severe pyorrhœa, while uncared for and dirty mouths are entirely free from them. These cases led some people to think that there must be some unknown reason for this susceptibility in one case and the immunity in the other. The quest for that reason has led them to propound the theory that the disturbance on acid or alkaline side of the blood-reaction causes these diseases. Accordingly their treatment which

consisted of the correction of local conditions now requires the correction of that disturbance in the blood-reaction by means of judicious adjustment of the diet. Hence the subject of treatment has now passed beyond the sphere of mere dental surgeons and medical men can, if they interest themselves in the subject, help in their treatment. I commend this subject to the notice of my readers.

DENTAL CARIES IN CHILDREN. THE IMPORTANCE OF THEIR PREVENTION, EARLY RECOGNITION, AND PROMPT TREATMENT

BY

K. VENKAT RAO, L.M.P.,

Purasawalkam, Madras.

THE tendency in these modern days, perhaps rightly, is to attach more importance to oral sepsis as a primary or contributory cause to the origin or aggravation of diseased conditions in the human body. The physician recognises the importance of first and foremost attention to the hygiene of the mouth as a contributory factor of no small magnitude in the successful treatment of diseases, whereas the surgeon refuses to operate upon his patient unless, the teeth and the gums are attended to by a dentist.

Appreciation of the above facts will convince the public the importance of dental caries in children. It is a powerful cause of ill health in children. (Still). Apart from its local effect of pain etc., it interferes considerably with the proper assimilation of food. A child with caries would generally bolt its food without masticating which is so essential for the proper digestion and assimilation of food. Therefore the commonest evil is disorder of digestion and failure of digestion means failure of nourishment. In childhood assimilation of food is necessary not only for the body already built, but also for the growth of the body as a whole. Hence wasting is one of the commonest symptoms of digestive disorder brought about by carious teeth.

Pain of colicky nature is another frequent symptom of dental caries. There is poor appetite and this loss of appetite is very obstinate. Attention to the teeth brings about a speedy cure of the condition, where no other treatment is of any use.

Anæmia is sometimes present with extensive caries. Though this may be partly accounted for by the impairment of digestion, there is evidence to show that chronic poisoning from septic absorption from the mouth must have some share in its production.

There is some evidence to show that carious teeth by giving

rise to the enlargements of lymphatic glands in the neck, predispose them to subsequent attacks of tuberculosis. It has been found, that many children with carious teeth have definite enlargements of lymphatic glands in the neck of a tuberculosis nature. This fact will at least give a greater weight to the plea of necessary early attention to the conditions of teeth in children.

Carious teeth have also been recognised as a cause of certain nervous disorders, such as habit spasm and epilepsy. The local irritation or pain may give rise to some kind of spasm, which might continue in spite of the absence of pain. As regards the latter complaint associated with carious teeth, setting right the condition has brought about either a complete disappearence of epilepsy or a considerable reduction in the number of fits. Another common nervous symptom accompanying caries is headache. This may not be limited to any particular side of the head but may be general, occipital, parietal or frontal in distribution.

Prevention.—The importance of preventing dental caries in childhood, which are the cause of such diverse symptoms cannot be overestimated, when it is recognised what it is for a child to have perfect teeth, for the all important function of absorption and assimilation of food, so essential for the normal growth of a child. Prevention proper must begin with the mother during pregnancy, by an adequate supply of good nourishing food with all the vitamins and especially vitamin D. It has been found that the absence of vitamin D causes the dental tissue to be porous and brittle, which makes them liable to become carious.

Breast feeding must be insisted upon. For, this means an adequate supply of easily assimilable food for the child. Artificial feeding exposes the child to the great risk of gastro-intestinal disorder, apart from its being deficient in certain vitamins. The importance of gastro-intestinal disorders in the causation of caries will be presently understood.

Prevention of digestive disorders is equally important, as this will reduce the general resistance of the body and produce a want of food material in every part of it, which is essential for its proper growth, a function of supreme importance at this age. The same want for the growth is shared by the teeth as well and their structure becomes definitely porous, thereby making them vulnerable to the attacks of harmful acid fermentative materials in the mouth.

The common belief that sugar, by itself or in the form of sweets causes caries of teeth is only true to a little extent, as it has been found that sugar as such, disappears from the mouth completely in about fifteen minutes time after chewing sweets. But biscuits, potatoes, and bread remain for a considerable time in and around the teeth, causing acid fermentation and this material attacks the enamel of the teeth. Hence it will be a good

plan to insist upon rinsing of the mouth after eating any of such food stuffs.

Cleaning of teeth both morning and at bed time and especially the latter should be made a habit in children. This can be done in older children with the help of tooth brush, whereas in very young children chewing a piece of raw apple would serve the same purpose.

Deficient diseases such as rickets should receive prompt treatment, as in this disease the want of deposition of calcium is also felt by the teeth.

Vitamin D is concerned with the structure of teeth and alveolar bone, while Vitamin A plays a similar part with regard to the structure of the marginal epithelium of the gums. M. Mellanby concluded "that there was a close relation between structure, or calcification and liability to caries...." The result of investigations leaves little room for doubt that the initiation, spread and arrest of dental caries in children can be controlled to a very considerable extent by including in their deit an abundance of those food factors which had previously been shown in animal experiments to exert a favourable influence on the calcification of the teeth. (Vitamins. Medical Research Council 1932). From the foregoing facts it can be safely concluded, that the routine administration of codliver oil to infants especially to the hand fed is better made the routine from the third month onwards, as this is a rich source of Vitamins, both A and D. In addition, to children artificially fed an additional supply of calcium in the form of some chemical food will be found useful.

Medical men and parents should be on the look out for any defect in the teeth such as loss of colour in the enamel or spots of erosion, so that preventive steps on the lines stated above may be at once undertaken. "A stitch in time saves nine" is better applicable here. When there are definite caries, a thorough examination of the child should be done by the physician so as to find out the causes for the same as to enable the necessary general treatment to be instituted without the least delay. The dentist should also examine the teeth and remove those which are beyond repair and stop the rest. The prevailing idea that carious deciduous teeth need not require attention, feeling sanguine about the eruption of the permanent teeth, cannot be too strongly deprecated. Much harm would have been done before that event, even though one can hardly get good permanent teeth in such cases. Last but not least in importance is the necessity to impress upon medical inspectors of school children to look carefully into the mouth as a routine and detect caries and insist upon such children seeing a dentist.

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Editorial

THE PROBLEM OF THE INFANT, THE PRE-SCHOOL AND SCHOOL CHILD IN INDIA

THIS is a problem of vast magnitude, extremely complex and complicated in nature, demanding the serious and immediate attention of the Medical Profession in India at the present day and this is our apology for introducing this subject to our readers in this Special Number. Pediatrics, we all know, is that branch of medical science which specially deals with the diseases and disorders of children and this aspect of the problem has been fully and ably dealt with in the preceding pages—thanks to the energy, enthusiasm, earnestness and erudition of our worthy contributors, who have made this special number a unique success. If we have not touched on any aspect of children's diseases here but have proceeded to deal with some aspects of 'Preventive Pediatrics', it is because, everywhere throughout the world, incessantly, the cry goes forth, "Save the babies! Save the children!!", irrespective of caste, creed, colour, nationality or territorial barriers. We cannot, therefore be insensible to this world-call and brush aside this all-important question without even the barest consideration given to it in this Special Number.

Infantile Mortality

The Great War of 1914 had not only caused the slaughter of millions of adult human lives but also showered unbounded blessings on the human race and one of those blessings was the attention bestowed on the child and the attempt made to prevent the enormous 'Slaughter of the Innocents', on the face of the earth,

by a net-work of baby welfare organizations, ante-natal clinics, maternity homes and the like. India was not unmindful of her duty to her children but what had been done so far was only slipshod and transient. Let us take the infant first and see how far his health had improved since the conclusion of the war in 1918. Vital statistics is said to be the barometer of the health of a nation and judging from the figures, we find the infantile mortality in India steadily declining. "Almost without exception, the provincial graphs show that since 1918 and particularly during the last decade there has been a distinct downward trend in the registered infantile mortality rates and in some cases, this trend has not been only continuous but comparatively rapid", thus observes the Public Health Commissioner with the Government of India in his Annual Report for 1930. Whether this was the direct outcome of the establishment of child welfare organizations in India or not was also unambiguously answered in the same report which says, "It is to be observed that infantile mortality in British India began to fall immediately after the 1918 influenza pandemic and that there has been little interruption in the downward trend of its incidence since that date. Once this has been recognized, it is obvious that the child welfare schemes which are now to be found at work in numerous centres throughout the country could not have been responsible at least for the initial decrease in infantile mortality and few could claim that these isolated efforts—however admirable they may be in certain instances—could have exerted any influence. Indeed, the largest and most continuous decrease in incidence has been recorded in the Province of Assam, where practically no child welfare work at all is being done".

Though there has been a slight decrease in infantile mortality during the past decade, the infantile mortality rate in this country is still appalling, as compared with the rest of the civilized world. The following figures will be found interesting. Taking 26 important countries of the world for purposes of comparison, the infantile mortality rate for British India during 1931 was 179 per 1,000 live births and India stands topmost in the list. Next comes Hungary with 162, Egypt 160, Portugal 146, Czechoslovakia 134, and Japan 132. The lowest infantile mortality rate has been recorded in New Zealand (32), Australia (42), Switzerland (49), Netherlands (50), Sweden (57), United States of America (62), South Africa (White) (65), and England and Wales (66). Scotland has recorded 82, nearly half of British India. While the figure for British India is staggering, it will be a source of consolation—

poor consolation though—to find that the infantile mortality rate for India which stood at 267 in 1918, came down to 179 in 1931, as pointed out previously. During the same period, England's rate came down from 97 in 1918 to 66 in 1931. It is a strange coincidence to find that even the general mortality rate for British India for 1931 (24.9) was double that for England and Wales (12. 3) and it ranks highest next only to Egypt and that New Zealand and Australia have even here recorded the lowest mortality rates, (8.3) and (8.7) respectively. Thus it is evident that India should put forth Herculean efforts to bring down her geneneral and infantile mortality rates to the level of the other civilized countries of the world.

Causes of Infantile Mortality

Now, coming to the causes of infantile mortality, we cannot do better than quote the final conclusions arrived at by the Reporting Committee on Maternal Welfare and the Hygiene of infants and children of Pre-school age and embodied in the Leauge of Nations publication dated 15th October 1931. "The three main dangers', according to the report, are (i) congenital and developmental defects (ii) alimentary disturbances and (3) infective diseases, the first accounting for nearly all still-births and deaths in the first seven days of life, the two latter affecting the older children. Sanitary improvements which have influenced materially the last two dangers, have not affected the first, in which prematurity plays such an important role. This is in turn due to (1) chronic infections *e.g.*, Syphilis, (2) constitutional weakness etc., (3) acute disease *e.g.*, influenza; (4) accidental causes *e.g.*, trauma etc., Obstetrical difficuities also contribute. In order, therefore, to reduce the infantile mortality further, it will be necessary to pay much attention to the first danger and its causes". In India, statistics are not available, and even if available are not reliable, to determine the causes of infantile mortality. But it may safely be presumed that premature births, convulsions, fever, mal-nutrition, respiratory diseases and bowel complaints are the main causative factors in the death rate under one year.

Remedial Measures

1. **Ante-Natal Care.**—The old, time-worn method of dealing with infants only from the day of their nativity, is gone and to-day, they are looked after even while yet as foetuses in their mother's wombs. This involves the care of the mother as well and the

greater the protection given to the mother during pregnancy, the lesser the chances of maternal and infantile mortality. Anæmia during pregnancy, Eclampsia, Pre-mature delivery, Still-births and a host of infectious diseases affecting the mothers shorten the lives of the infants and this explains the need for Ante-natal care. " Ante-natal work properly carried on is the largest single measure concerned in the reduction of the maternal mortality rate". Despite the fact that in England and Wales there are now 1000 municipal and 250 rural ante-natal centres available as against 77 municipal and 61 rural centres in the Madras Presidency, there is despair and despondency expressed in responsible quarters. Thus, Sir George Newman, Chief Medical Officer of the Ministry of Health in his recent report on the health of England observes: " It was now not less than ten years since an organised effort had been made in this country to reduce the average maternal mortality rate. For twenty years, that rate had remained static or about 4 deaths per 1000 births. There were important issues to which they must apply themselves, unremittingly, if they really desire to reduce the mortality. Inquiries into the deaths of mother in child-birth during the year indicated that in 23% of them, *the absence of effective ante-natal supervision contributed to the fatal issue.*" This is a wholesome lesson for India to learn.

2. **Natal Care.**—It is a well-known and indisputable fact that the majority of women in India are delivered under the most deplorable conditions of poverty, ignorance and quackery. The unskilled 'dhai' is the largest contributory factor in maternal mortality and unless she is replaced by trained midwives, there is no prospect of maternal mortality falling in the near future.

The maternal mortality rate is less in rural than in urban areas. For instance, in the Madras Presidency, it was 8.3 per 1000 live births in rural and 14.3 in urban areas in 1931. In England and Wales too, the urban areas record the highest, while, in fact, the reverse ought to be the case. But the anomaly in India of the reverse being the case requires careful investigation, though the Public Health Commissioner with the Government of India tries to explain it away as due to defective registration. It has been estimated that more than 50% of the maternal deaths in India is due to 'Sepsis' a wholly preventable cause. With more ante-natal clinics, health-visiting, maternity homes and trained midwives there is every possibility of the maternal and infantile mortality decreasing.

3. **Post Natal Care.**—This is another neglected feature of

maternity, which is responsible for heavy infant toll in India. Any amount of prenatal care, aseptic precautions, hospital delivery or attendance by a trained midwife or a qualified obstetrician will be of no avail, if the mother and infant are allowed to live thereafter in low hovels without light and air, amidst unhygienic surroundings and with scanty means of subsistence. The Health visitor must follow up these cases and bring to the notice of the parents any defects in the mode of living of the mother or in the rearing up of the child for their timely rectification ; otherwise, the mother or the infant or both are liable to risk of infection and disease and untimely death.

4. **The Economic Uplift:**—This brings us on to a consideration of the economic problems connected with child-bearing and child rearing. Unless there is real improvement in the economic condition of the masses of India our efforts will all be in vain. In this connection, it would be interesting to re-call the observations of the Lady Superintendent of the Child Welfare Scheme of the Corporation of Madras, in her Annual Report for 1929. She says: "It must be mentioned that infantile mortality cannot be reduced to an appreciable extent by measures directed solely to the mother and child. For instance, of what avail is the advice to the mother on the care of her baby if the father is a syphilitic, or if those who fondle the child are suffering from tuberculosis or any other infectious disease, or if the mother lives in a place where the hygienic surroundings are far from satisfactory and precautions are not taken to prevent food and drinking water from getting contaminated. Above all, poverty is a great bar to sanitary and social progress. There is no use in telling a poverty stricken mother who has no milk of her own that she should not feed her baby with conjee made of starchy food-stuffs and that she should give cow's milk instead. Health is therefore largely dependent on the resources which a community has at its disposal, and it is the community standards which establish the mortality rate and determine largely whether the baby shall be well and healthy or whether it shall sicken and die. The Corporation has bestowed a great blessing on the poorer classes by giving a free supply of good cow's milk to poor and needy infants but the number of such babies receiving free supply of milk at the Child Welfare Centres is limited. There are hundreds of poor babies who die annually in this city from bowel disorders, malnutrition, rickets etc., due to want of proper nourishment during their first year of life. However strenuous the efforts of the Child Welfare Scheme and other

social welfare institutions may be in improving the welfare of the poor women and children in this city, yet, in the absence of the means of obtaining proper nourishing food both for the mother and the child, of preserving cleanliness and of obtaining facilities for healthy living and leading happier lives, their efforts are bound to fall short of their expectations". Conditions are just the same in other parts of India.

5. Closely associated with the economic problem is the **unemployment problem.** This has become a *world-menace now* and has converted many a happy family to rack and ruin driving them to starvation, misery and death. Unemployment has adversely affected the health of the people and according to a recent investigation in five cities by the United States Public Health Service, it has been demonstrated (1) that the "poor group which made up only 13% of the total in 1929, constituted 51% in 1932, while the comfortable group dropped from 57% of the total in 1929 to 10% in 1932, (2) that those individuals who suffered the greatest reductions in income between 1929 and 1932, have the highest sickness rates and (3) that respiratory illness constitutes a large part of all the sickness and *among children, the infectious and communicable diseases occur frequently*". While such is the condition in America, the havoc of unemployment in India where no systematic survey with regard to this problem and no earnest attempt with regard to its solution, have as yet been made, can better be imagined than expressed.

6. **The housing problem** is another contributory cause for the heavy infantile mortality in India. The slums are a disgrace to civilization and humanity and recognizing this, modern nations vie with one another in clearing slums and ameliorating the lot of slum dwellers in all possible ways. In England, decent housing accommodation has been provided for slum-dwellers but a new danger has arisen. Rents swallow up a large part of the labourer's income there, so much so there is nothing left for their sustenance. On this point it is of great medical interest to learn from Dr. McGonigle, M.O.H. of Stockton-on-Tees, that re-housing may have unexpected consequences. "Following the local slum clearance scheme, he found", says the Medical World, "that the death-rate went up among the families removed to a municipal estate while that of the slum-dwellers left undisturbed remained much lower. His enquiries pointed to a deficient dietary as the cause of this misfortune to the transplanted families and he cites plenty of evidence to show that money formerly spent on food went to pay the high rents of the up-to-date dwellings". Let India beware of this danger.

7. Among other causes may be mentioned **infectious diseases** such as small-pox. This is one great single cause of infantile mortality in India and the importance of compulsory vaccination and re-vaccination cannot be too strongly emphasized.

8. **Better midwifery, qualified attendance by doctors at the time of delivery, propaganda and education.**—These go a great way towards minimizing infant and maternal diseases and reducing infantile and maternal mortality. For propaganda and education, cinemas should be largely availed of and they must be travelling cinemas as in Germany, France and other countries. Unfortunately, in India, cinemas exert a baneful influence at present by lowering the standard of morality of the people. Such cinemas should be strictly prohibited and only those which elevate the people's health and morals should be encouraged.

The Pre-School Child

The problem of the pre-school child is essentially a dietary problem. As long as the baby has very little to say in regard to his food, things go alright and his gain in weight and development goes on in the most satisfactory way. But when once he gives up his dependence and begins to take his own food and stand on his own legs, there comes the rub. Unfortunately his is not the choice but the elders provide him with what delights their tastes and not what suits him, with the result that his digestive organs are easily upset and he becomes an easy prey to vomiting, diarrhœa and all sorts of infections. Among the latter, tuberculosis is the most notable. In planning the toddler's diet, Dr. Bellewood-Comstock M.D., says that vegetables, starchy foods and milk or its equivalent form an important trio and adds:—"Vegetables should be cooked down in their own broth without any fatty seasoning. At first vegetables should be made into a puree, but they can be taken by the two-year old child in almost any single form. Again milk must form a very important part of the meal and if drinking milk gets a bit tiresome to the child, he may be beguiled in its use by its being served in connection with other foods, as in soups, simple desserts, cottage cheese and in many other ways that the mother and housewife will be able to contrive. And it is needless to say that the use of pepper, condiments or rich sauces of any kind should be avoided for the child and that tea and coffee should be interdicted. Even cocoa should be used only occasionally and only

with the older child, and in the author's opinion, every child is better off if meat is not included in his diet. Extra vitamin containing juices as orange or tomato juice given daily will insure the child normal progress away from the danger of rickets and other phases of imperfect nutrition ".

The clothing and enviornments of the pre-school child should receive as much attention as its food and it would be presumptuous on our part if we should attempt to detail them here. Our readers certainly know what they are.

The School Child

This is the last stage of the children's problem and perhaps the most intricate stage. The health of the school child depends first on himself, next on the parents and lastly on the teachers. The school doctor is also an important and indispensable actor in this drama. The employment of a school physician is necessary for an efficient school medical service. He must be on full time or on part time depending on the resources, and size of the school. The school physician must have regular office hours during which he stays in the school. He must always be on hand at such hours for consultation on children referred to him by the teachers or other school authorities for exclusion, readmission etc. The weight and measure of each school child should be taken regularly each month or oftener if necessary especially of children in the elementary grades. Weighing and measuring is perhaps the easiest method for following the child's health between physical examinations. It has another purpose—that of interesting the child in his own health. This work can well be done by the teacher himself. The school physician has a share in health education by giving health talks, writing health publications, and special messages to parents, organizing special meetings for health promotion, showing health moving pictures and exhibits and making special campaigns. Immunization in the form of vaccination against small-pox, anti-typhoid inoculation and the like should be a part of the programme of medical service in schools. An ideal programme of school medical service should include the following:—

"(1) Provision for complete physical examination of each child prior to or on entering school. Parents should be urged to be present during the examination. The teacher and nurse must be present.

(2) Provision for two or more complete physical examinations of each pupil one at the middle of his school life, and the other prior to his leaving school.

(3) Provision for uniform methods of examining and recording, using a standard scale for recording defects and corrections.

(4) The health record of each pupil must be a part of this school accounting. It should be referred to constantly in making decisions affecting the pupil's progress.

(5) Provision for follow-up work, such as reporting to parents, visiting nurse service, education etc.

(6) Campaign for correction of defects.

(7) Medical inspection of all children annually at the opening of school for the detection of communicable disease.

(8) Daily morning health inspection by the class-room teacher or the school nurse".

Medical inspection of schools in this country is yet in the experimental stage and no worth while scheme has been formulated and tried. In the Madras presidency, the scheme was inaugurated in 1924 and abandoned in 1932, due ostensibly to financial crisis but in reality to its failure, partly for lack of proper direction and management on right lines and partly on account of its inherent imperfections. The epitaph over its grave was written by Lt. Col. J. W. D. Webb, Director of Public Health, Madras, in these words:—

"Any system of benefit to school children which begins and unfortunately ends with medical inspection and inspection only is doomed to fail and to degenerate into a collection of unused statistical information. Through lack of understanding, I believe, the scheme has fallen into undeserved disrepute. One must admit that if such work is unsuccessfully performed, it is not only useless but is an unprofitable drain on the country's finances. Recently as a measure of retrenchment the Government decided to close down medical inspection of school children until finances improved. I personally regret this step very much because I am one of those who would have said 'yes' if I had been asked the question—"Do you believe in the good health of school-children in the Madras Presidency as an important nation-building work".

Here is a hint for the Government of Madras and also for other Provincial Governments to resuscitate and recommence medical inspection work or to start medical inspection work where it is not already in existence, on modern and up-to-date lines and to carry it through unceasingly. "Will they do it?," is the question. Echo answers, "will they?".

Our leader has already become too long and we think we must stop here. We have given a fair indication in these pages of the enormity of the problem before us which requires all the resources and good-will of the Government, the willing co-operation of the public and above all, the zeal and enthusiasm of the medical profession in India to tackle it and bring it to a successful termination. It will certainly be a red-letter day for India when by a happy combination of these trio, the happy consummation is reached when this country, instead of topping the mortality list of the world, sinks to the bottom of it. We yearn for that glorious day and hope it is not far-off.

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