

The Antiseptic

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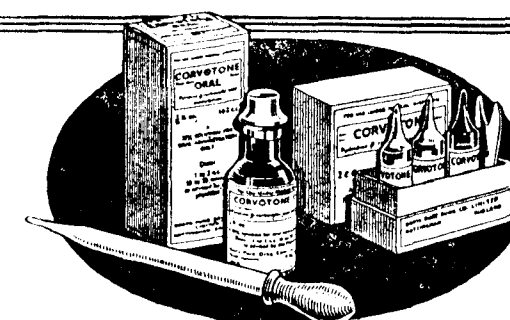
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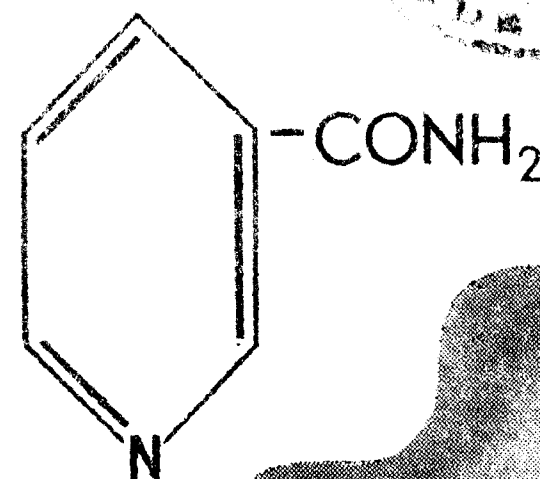


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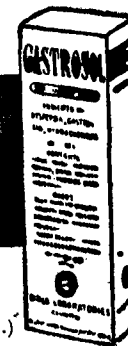
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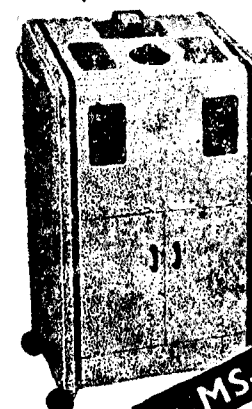
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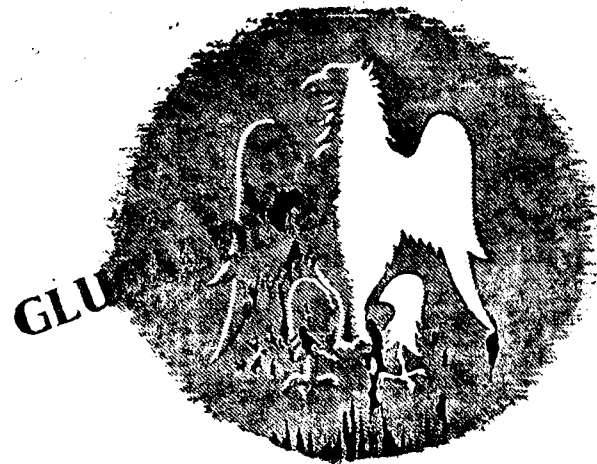
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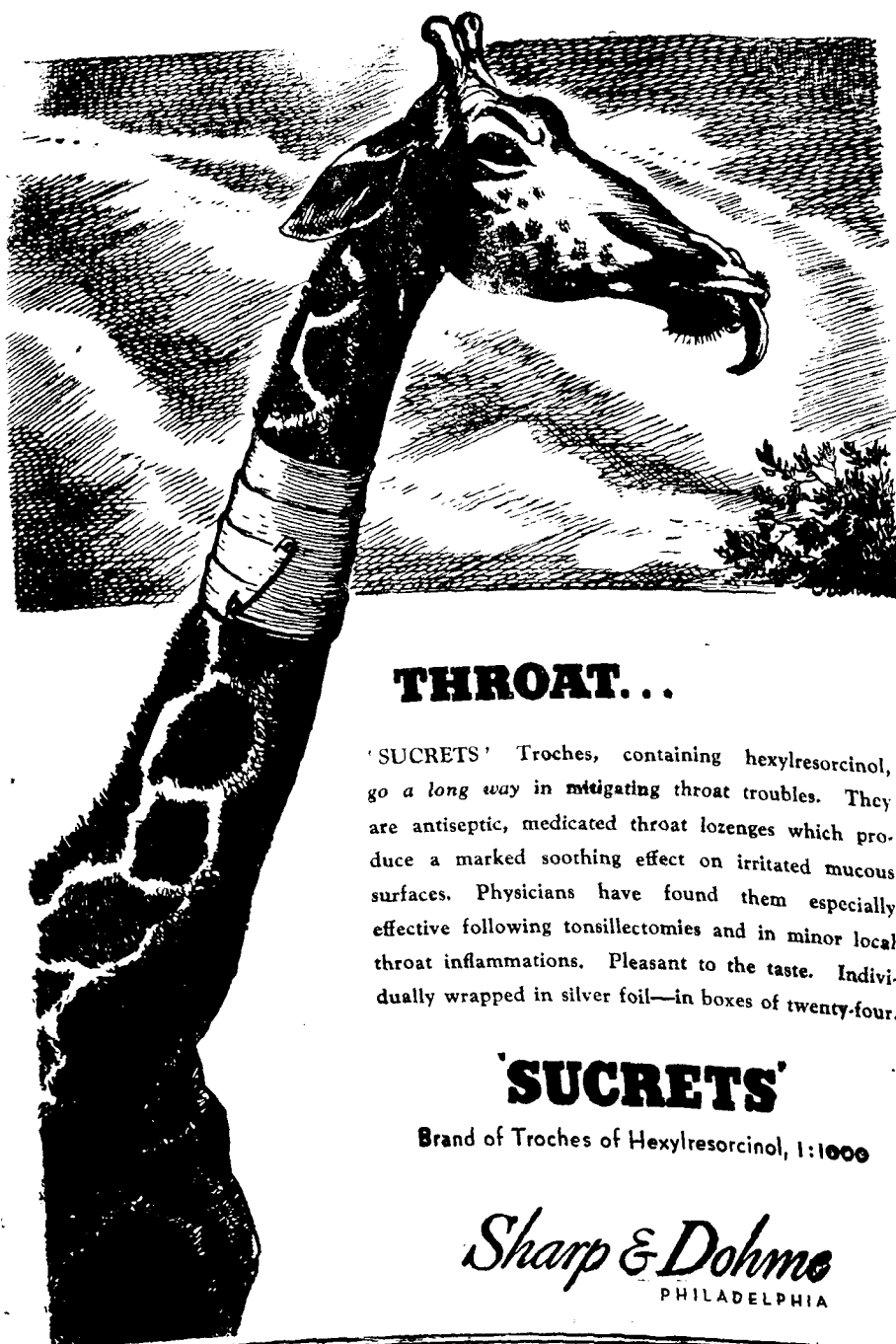
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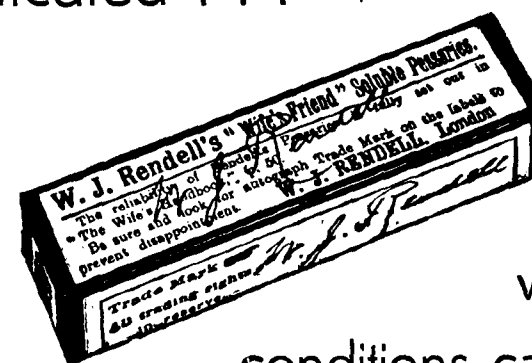
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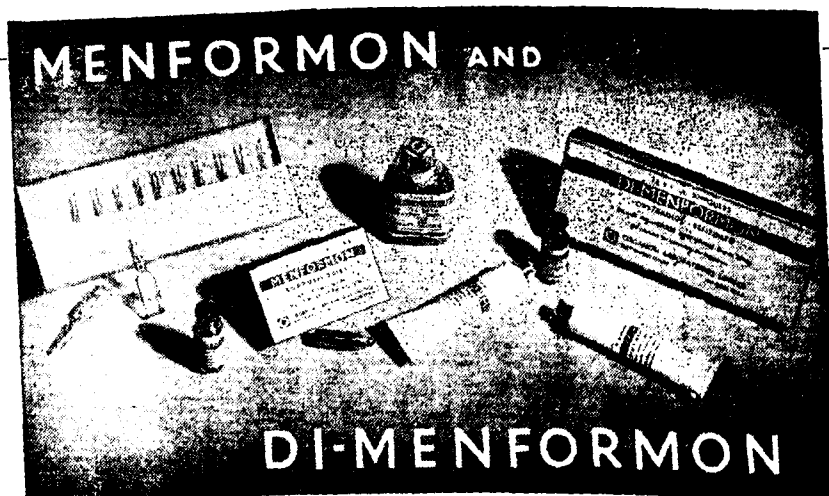
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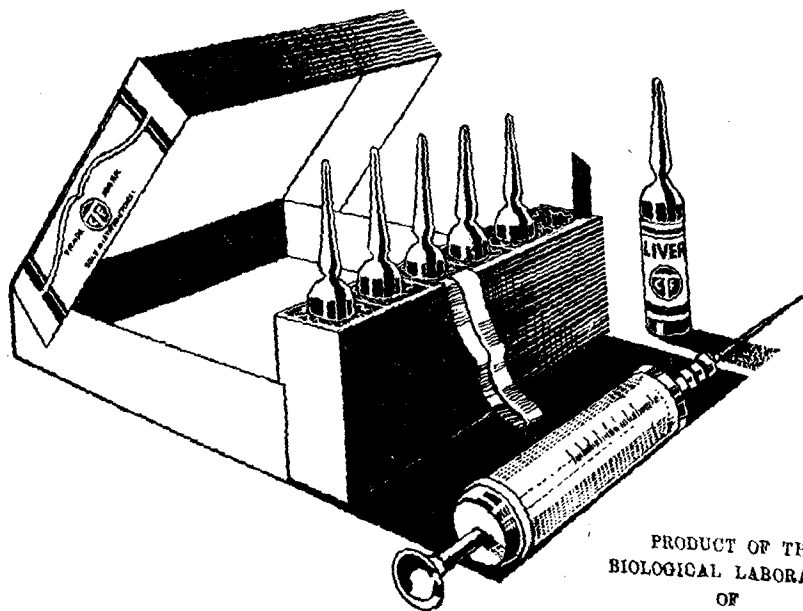
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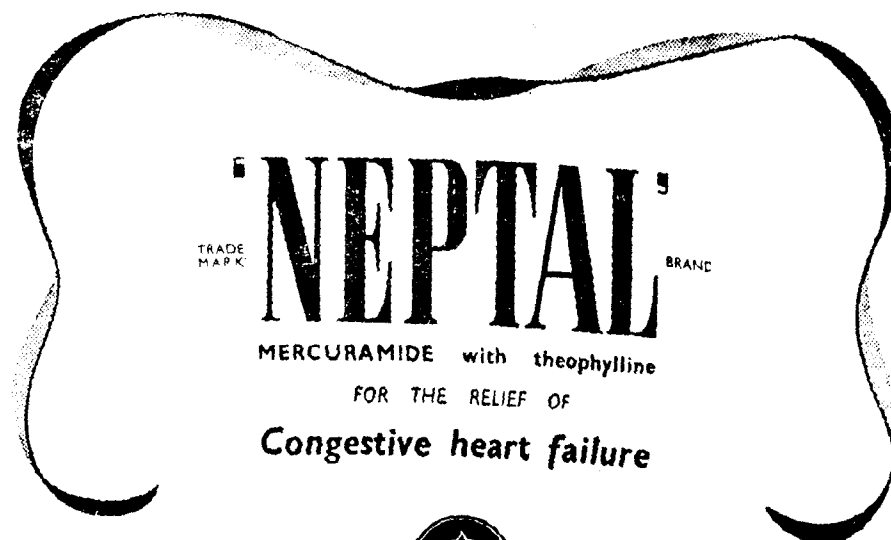
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Original Articles

Deafness*

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THE VIII cranial nerve has a sensory (cochlear) division, concerned solely with hearing, and a non-sensory (vestibular) division, associated with equilibrium. These two nerves are distinct peripherally and have separate central connections.

The cochlear (or auditory) nerve fibres arise from the cells in the "spiral ganglion" situated in the central pillar of the cochlea, and their peripheral terminations end in the hair cells of the "organ of Corti." Centrally, the cochlear nerve passes to the brain through the internal auditory meatus, and enters the lower border of the pons to terminate in the dorsally placed "cochlear nucleus," which lies just external to the "retiform body." From here, the fibres decussate and run in the "lateral fillet" to the "internal geniculate body" and "inferior corpus quadrigeminum (primary auditory centres)". From these primary centres, a fresh relay of fibres pass to the higher auditory areas, in the "superior temporal gyrus" of the cortex.

Destruction of cochlea, or the cochlear nerve, or even cochlear nucleus in pons or lateral fillets, produces nerve deafness. Irritative lesions of these, and especially of the peripheral terminations, give rise to tinnitus, though brain stem deafness is rare. But, lesions of central auditory paths, and especially of superior temporal gyrus, do not destroy hearing, as each ear has a bilateral cortical representation, though, in right handed persons, a lesion of left superior temporal gyrus may abolish the comprehension of words and sounds heard (word deafness).

It is important to remember that as the VIII nerve passes from the brain stem, across the lateral recess of posterior fossa, it is in close connection with the V and VII nerves; as such, clinically the functions of all the 3 nerves may be interfered with, by a tumour (acoustic) — the usual variety being the auditory fibroma.

* A lecture delivered under the auspices of the Indian Medical Association, Madras Branch recently and sent to 'The Antiseptic' for publication.

[629]

Deafness may be defined as the consequence of some defect in hearing which makes it difficult for the patient to appreciate sounds, or combination of sounds, as readily as a normal person. The mechanism of hearing consists of (a) sound conducting part, which includes the external ear, tympanic membrane, the 3 ossicles, and the middle ear with the intra-tympanic muscles. These are responsible for the collection and transmission of sound to the next; (b) sound perceiving part which consists chiefly of the cochlear and the nerve endings of the auditory nerve, arranged along a vibrating membrane inside a double coiled tube filled with fluid. Perfect hearing depends on the integrity of not only the above two parts, but also of the auditory tracts and centres in the brain. Relatively, however, in man, the auricle is of no importance for hearing. Many people hear excellently with perforated or scarred, or with no tympanic membrane at all. Of the visicles, the outer two, *viz.*, the malleus and incus, are not so essential as the 3rd stapes, which should be normally moveable in the oval window, to ensure proper movement and tension of cochlear fluids. It is also essential to have the integrity of the nerve endings in the cochlea, and their fibres.

Physiology.—Leaving all controversial theories, it will suffice if we remember that sound waves consist of vibrations of the air, *i.e.*, of alternate phases of condensation and rarefaction. The problem to be solved in the ear, is the conversion of vibrations of air into vibrations of fluid.

Regarding the transmission of sound, it was till recently presumed that the sound waves strike the drum membrane, which is set in vibration, and that is conveyed through the malleus and incus, to the comparatively small foot plate of the stapes and thus to the fluid of the labyrinth. The former two ossicles making a 3:1 lever-like arrangement, and the large tympanic membrane conveying the vibrations to a small 20:1 foot plate of the stapes, were supposed to increase the pressure to 60:1. But it is everybody's experience that, even with a large perforation or even destruction of malleus and incus, as after a radical mastoid, one can still hear, provided the membrane filling the oval window is intact, which is now considered as playing an important part in the transmission of sound by the drum head to the air in the tympanic cavity, and thus reach the into vibrations. This explains why an otosclerotic tympanic membrane, or absorption of air, or the presence of fluid in the tympanic cavity or ankylosis of ossicles, etc., prevent good hearing.

Regarding the interpretation of sound, two theories are in vogue, *viz.*, (1) Helmholtz's resonance theory of peripheral (or cochlear) analysis and (2) Rutherford's telephone theory of central analysis (in the brain itself). Though there are several clinical objections to both, the weight of opinion at present is in favour of the former. In short, it consists of the principle that if a tone is sung near an open piano, its string which is attuned to the basilar membrane of cochlea is increased or decreased (consequently according to the pitch of the tune. This theory presumes that each sound produces a corresponding point or sound pattern of resonance in the bacillary membrane.

Clinical pathology and ætiological classification.—(1) Of the deafness that occurs at any period of life (a) *acute obstructive deafness* is the commonest. Its causes are: (i) Impaction of wax or a foreign body in the external meatus, suddenly slipping deeply in, and pressing the tympanic membrane, which, in its turn, drives the ossicles inwards, and fixes the stapes of the oval window. Here, the impaired movement of the ossicles interferes with the mobility of the oval window, and so, with the movement of the cochlear fluid; (ii) the same happens when there is an obstruction of Eustachian tube. Air cannot enter the middle ear from the nasopharynx, and the air that is already in the middle ear is absorbed. The atmospheric pressure in the external auditory meatus, pushes the tympanic membrane inwards, with immobilisation of the oval window as before; (iii) fixation of ossicles is also brought about by an effusion of catarrhal or purulent fluid into the middle ear, bulging the tympanic membrane now, outwards. The ossicles are now immobilised in an overstretched condition. Clinically, the tympanic membrane in the catarrhal variety looks pale and bulged, with clear fluid or even shifting fluid level. In the purulent type, the membrane looks reddened, thick and bulged with pus, *i.e.*, acute otitis media; (b) If the above conditions are left unremedied, the intra-tympanic muscles which support the ossicles are also put in an overstretched condition and later, they may get even fibrosed. This gives rise to a *chronic obstructive deafness*, of some standing. In inflammatory conditions, the mucous membrane around the oval window gets fibroid. In a purely chronic catarrhal condition, without a history of previous otorrhœa, the deafness dates from an acute naso-pharyngeal catarrh, usually without any tinnitus. This little point is of some diagnostic significance. On an otoscopic examination, the tympanic membrane looks rather opaque and thickened, but indrawn markedly. Inflation by a Politzer bag usually gives some relief. This is known as the *exudative form of chronic catarrhal otitis media*. But in those cases where there is a history of previous purulent discharge, *i.e.*, *chronic suppurative otitis media*, one usually sees a perforation of the tympanic membrane. Next, there will be slight necrosis of the ossicles. Finally, there will be fibrosis and scarring of the mucosa over the inner wall of the middle ear, with complete limitation of movement of stapes. It is this last stage that will destroy all useful hearing in the affected ear.

Functional examination.—For clinical purposes, the auditory apparatus is divided into (a) sound conducting arrangement, which includes the external acoustic meatus, and the middle ear cleft with the tympanic ossicles and joints, *i.e.*, all those structures as far as the outer surface of fenestra ovalis. Lesions of these parts give rise to obstructive deafness (or middle ear deafness); (b) sound perceiving arrangement, which includes all those structures from the inner side of fenestra ovalis (throughout cochlea, the VIII nerve tract, and the cortex). Lesions of these give rise to nerve deafness (or inner ear deafness). Although the static labyrinth is structurally continuous with the above auditory labyrinth, their functions, however, are quite apart, the former serving as a peripheral organ of equilibrium, while the latter is concerned with audition alone.

Before proceeding to the actual tests, one should keep in mind the purpose of his examination. It consists of (1) to find out the type of deafness; (2) to estimate the degree of deafness; (3) to pronounce the prognosis and the progress of the disease, after satisfying by an otoscopic

examination that the external auditory meatus is free from any obstruction such as wax, foreign body, tumour, etc.

A. An ordinary watch (or to be more accurate) an acoumeter is slowly brought from a distance towards the affected ear, and when the patient just begins to hear, the distance "X" from the ear to the watch is recorded, and then, if a normal ear hears the same watch at a distance "Y," the acuteness of hearing is expressed as X/Y. To obviate the error due to the hearing from the fellow ear, the latter can be closed by the patient with his finger or preferably with Barany's noise apparatus which occupies the attention of the unconcerned ear. For children, it is better to close their eyes. This precaution is useful even in adults to avoid lip reading, especially in the following tests, viz.,

B. *Whispered sounds*, and if that is not heard, ordinary low, and later *loud conversation*, (preferably, single words containing the lowest pitched 'r' and the highest pitched 's') and the patient is asked to repeat the words. The result, though approximate, is compared with normal, and the ratio, or the degree of hearing, is recorded as above X/Y.

Secondly to find out the type of deafness and to locate the seat of lesion, a tuning fork with about 300 double vibrations per sec. and provided with clamps to avoid overtones, is used. By (a) *Rinne's test*, the vibrating fork is held in front of the ear to be tested, and his capacity for air conduction A.C. is observed. As soon as he ceases to hear, it is transferred to the corresponding mastoid process, and his capacity for bone conduction B.C. is noted. If it is not heard now, the patient's air conduction is said to be greater than bone conduction, i.e., A.C. > B.C. The result is recorded as Rinne + ve. This condition is found in normal ear, and also in nerve deafness, i.e., "inner ear lesion"; but in the latter, both air and bone conductions are comparatively less than normal. If Rinne is positive, we conclude that there is no lesion of middle ear, i.e., no obstructive deafness. By (b) *Weber's test*, the sounding fork is placed over the patient's vertex. He will be able to hear better in that ear where there is greater middle ear obstruction. Thus, it is particularly useful to distinguish between the two ears, and to detect especially lesions of sound-conducting mechanism. The rest of the procedure is the same as for Rinne's test, i.e., comparison of air and bone conducting capacity. Weber is said to be + ve, when bone conduction B.C. > A.C., i.e., air conduction. Thus, it is quite the reverse of the former Rinne's test. We get a + ve Weber, in cases of obstruction deafness, as opposed to nerve deafness. By the classical (c) *Schwabach's test*, the sounding fork is placed at first over the patient's vertex, and when he ceases to hear, it is transferred to the examiner's vertex, and *vice versa*. There, the bone conduction is compared with that of the examiner, and the result recorded as 'Schwabach,' shortened or lengthened. However, this test is not so much in vogue, as it presumes that the examiner's hearing is normal.

Thirdly, by the detection of lower and upper tone limits, by a tuning fork of 16 double vibrations, and a monocord of 20,000 vibrations per second, one can find out the nature of the lesion, as well as the progress and prognosis of the disease. Old age and nerve deafness affect the upper tone limit. Lower tone limit is lost in lesions of sound-conducting apparatus, and especially in otosclerosis.

In cases of malingering, the two tubes of a stethoscope, are attached

to the patient's either ear, and the examiner standing behind him, speaks through the chest piece. The patient is asked to repeat the words. Now, the tube leading to the sound ear is gently clamped, and if the patient is still able to repeat the words, we conclude that the supposedly defective ear is functioning normally.

N.B.—Just as we exclude obstruction of external canal by an otoscopic examination, Eustachian obstruction also should be eliminated by carrying on the above tests, before and after inflation. Thus alone, we can gauge the condition of other structures connected with sound conduction.

For purposes of **diagnosis**, (1) besides the above mentioned appearance of the tympanic membrane, it will suffice if we remember that in cases of:

I. Obstructive deafness, the high tones are heard better than the low tones; it is only the air conduction that is lost, and bone conduction is normal: Weber's test is + ve. Rinne is - ve; further, these people seem to have a relatively worse hearing for conversation, than for a watch or a fork; usually, in these cases, there is an evidence of some acute or chronic inflammatory condition in the nose, or nasopharynx; obstructive deafness is found at any period of life. On the other hand—

II. Nerve deafness is commonly found in adolescence and past mid-life.

They may be classified as (A) those of *sudden onset*, e.g.

1. Menier's disease, probably due to labyrinthine hæmorrhage, accompanied by sudden collapse, vomiting and nystagmus, usually in an adult. Similarly in 'Caisson deafness' sudden compression and expansion, give labyrinthine hæmorrhage.

2. Acute vestibulitis (i.e., inflammatory): (a) In the serous type, hearing may not be primarily destroyed, but (b) in the purulent type, hearing is always lost. This usually occurs as a complication of middle ear suppuration. Apart from that—

3. Infections of (a) mumps and (b) epidemic cerebro-spinal fever also enter from the cerebro-spinal spaces into the inner ear along the lymph tracts of the auditory nerve.

4. Acquired syphilis:—Seems to give a neuritis of (a) cochlear nerve, or (b) a neuro-labyrinthitis, usually bilateral, and occurring within a few weeks after the infection.

5. Concussion of the labyrinth, (i.e., traumatic) may be due to: (a) fracture of petrous temporal bone, or any other head injury; (b) explosions, motor accidents, loud noises, or (c) even a forcible syringing or blows on the ear.

6. Focal lesions of Deiter's nucleus, such as disseminated sclerosis, hæmorrhage, thrombosis, embolism, etc., may produce transient deafness, tinnitus, vertigo, nystagmus, and pain over V nerve, as a distinguishing feature.

7. Hysterical deafness (i.e., psychogenic deafness) sometimes follows an emotional shock, and it is easily diagnosed by the fact that the patient blinks his eyes when a sudden noise is made behind him; and that it is possible to wake him up from a deep sleep by simply calling his name.

Though there is no pathological change, these cases require careful handling by an expert psychologist; usually a settlement of the compensation problem, is the first step towards the recovery of hearing. The characteristic feature of psychogenic deafness is, that though the cochlear apparatus appears to be non-functioning, the vestibule is normal. This condition should not be confused with:

8. Malingered deafness, which can be easily diagnosed by the stethoscope test as pointed above. Another test consists in the use of a tuning fork again. The patient's air conduction would appear to have been lost. When the fork is placed over the mastoid, probably he would say 'yes.' Now the fork is gently replaced by a lead pencil without his knowledge, and the former held close to the ear. If he still hears, surely it is a case of malingering. (B) Nerve deafness of more gradual onset may arise from the following:

(1) Extra cerebellar tumour (acoustic neurofibroma) of the nerve trunk or of the cerebello pontine angle is an important cause of chronic deafness in middle life. It is accompanied by giddiness, headache, vomiting, tinnitus, and diminished, or loss of, corneal reflex on the affected side.

(2) Syphilitic pachymeningitis of lateral region of medulla, and especially—

(3) Congenital syphilis is one of the commonest causes of gradual nerve deafness.

(4) Local meningeal changes, as a result of chronic suppurative otitis media, may give rise to a circumscribed serous meningitis.

(5) Chronic concussion deafness (and industrial nerve deafness) or noise deafness from repeated noises of machinery in factories, in boiler makers, weavers, gunners, gives rise to degeneration of nerve endings of the ear. Of late, this is assuming an increasing importance, in view of workmens' compensation for injury. Again, this has to be distinguished from malingering, as before, to avoid any injustice to either party.

(6) Vascular disturbances such as chronic anaemia, congestion of the labyrinth, especially leukæmic, also give rise to a gradual nerve deafness.

(7) Certain degenerative changes as in senility, arteriosclerosis, etc., give rise to a condition called (presbycusis) with +ve Rinne, lowered upper tone limit and shortened bone conduction. Senile deafness is physiological after 65, but there are great variations. It may be caused by degeneration of cochlear ganglion cells, or ossification of basilar membrane. These people speak in a loud unpleasant tone, in contrast to otosclerotics.

(8) Toxic deafness: (a) Exogenous—drugs such as, Quinine Tobacco, Arsenic, Bismuth, Salicin and even Mercury, Aspirin, and Salvarsan acting especially on VIII nerve, and (b) endogenous—septic foci, especially in dental tissues.

Clinically, in nerve deafness, there are: (i) no characteristic changes in the tympanic membrane; (ii) both the air and bone conductions are diminished, and are definitely shorter than in normal ear; (iii) with tuning forks, one gets a +ve Rinne and -ve Weber, as opposed to obstructive deafness; (iv) there is loss of hearing for high pitched sound; and (v) decreased hearing in midst of noise; (vi) hearing

for conversation is better than for a watch. Thus we see that the signs and symptoms are quite the reverse of those for conduction deafness.

III. There is a third condition called *otosclerosis*, with definite pathological changes, not a mere mixed deafness, as erroneously understood. It is a degenerative condition of the whole of middle and inner ear, including nerve endings and fibres, and is associated with changes in the bone of inner wall of middle ear, and of the cochlea; (1) it starts in early adolescence, commoner in women, made worse by pregnancy or any other mental or physical strain, and especially by intercurrent aural inflammation. Heredity and ductless glands especially, pituitary and thyroid, seem to have some influence; (2) on examination of the membrane, the classical flamingo pink sign due to the congested premonitory of the inner wall of the middle ear, can be seen through the membrane, or occasionally, the latter may be abnormally translucent. Beyond this, no other characteristic change is seen; (3) mostly the disease is bilateral, and if limited to one ear, the brunt of attack is borne by the cochlea; (4) the onset is insidious; (5) inflation by Politzer bag gives no relief; (6) usually, it is accompanied by a most disturbing tinnitus at some stage or other; (7) there is a loss of extreme high as well as extreme low tones; (8) by tuning forks one finds definite loss of air conduction: later, bone conduction also is found to be less than normal as opposed to simple obstructive deafness; (9) these people seem to hear better in a noise; this phenomenon is known as "Paracusis of Willis."

IV. To this list must be added a fourth group known as "*mixed deafness*," or combined nerve and obstructive deafness. Here again, there are two varieties, viz.: (1) those with a history of chronic suppurative otitis media, spreading to the labyrinth. In this case, the patient gets obstructive deafness at first, and later, nerve deafness supervenes over that; (2) if there is no history of otorrhœa, there must have been a chronic catarrhal or a sclerotic condition of the middle ear at first, and later on, disease of the cochlea supervening. Here also, one gets obstructive deafness at first, and nerve deafness superimposed later on. On the other hand, if he gets nerve deafness at first, and middle ear deafness later on, it is likely that the chronic middle ear catarrh has been superimposed over nerve deafness already present.

V. Deaf mutism.—We all know that children learn to speak by hearing. Consequently, if they do not get hearing power even till the age of 7, they become permanently dumb and mute. Causes of this condition are:

A. *Congenital*: These include (1) sporadic cases of: (a) absence of labyrinth; (b) mal-development where usually the membranous labyrinth and saccule are involved; and (c) heredity; (2) deaf mutism is said to be endemic in Switzerland, associated with goitre and cretinism, with mental deficiency and the middle ear being usually affected.

B. *The acquired type* may result from (1) intra-uterine disease, commonly congenital syphilis, or (2) post-fœtal, such as injury to labyrinth in fracture of cranial bone, or (a) mostly, inflammations of inner ear, i.e., labyrinth following meningitis, or the invasion of a suppurating otitis media; (b) adenoids may also be a contributory factor.

Diagnosis is best done by excluding cases of idiocy. As a rule, true deaf-mutes, are sharp-witted. They have a peculiar metallic voice. A

bell is rung behind the patient, or hands clapped, and the patient's response observed. This test is particularly useful in younger children. The appearance of the tympanic membrane depends upon the casual factor in the acquired type. But, in the congenital form, no change is observed. In this type, some "islands of hearing" are supposed to be present, and this is taken advantage of, for purposes of treatment.

Prognosis and treatment of deafness.—There are 3 general rules to follow, viz.: (1) we should never say that we can do nothing to assist a deaf person. In younger advanced cases, lip reading can be tried, especially for deaf-mutism, as some surviving hearing is usually left; or in elderly patients, it can be improved by a hearing aid; (2) secondly, if treatment gives at least some little improvement, as in cases of catarrhal obstructive deafness, it should be persisted, till maximum improvement is reached; in these cases, even surgical interference in the nasopharynx is justified, if that is the casual factor, to maintain the relief obtained, at a stationary level, and to avoid recurrence; (3) the third rule is that we should never persist in treatment, where we do not get any improvement, as in otosclerosis, lest it should do harm physically and mentally as well, remembering that depression is a deadly enemy of the deaf. Surgical interference is absolutely contra-indicated here. The treatment of individual cases, however, is dictated by diagnosis and cause: (1) obstructions of the external meatus are dealt with by syringing or otherwise; (2) in middle ear deafness, the aims of treatment are; (a) to restore the normal function of middle ear; (b) to avoid fibrotic changes in the inner wall which might impede the mobility of the oval window; and (c) to guard against relapses.

A. In suppurative conditions, treatment of deafness is subordinated to the safety of the patient. We first attempt to remove the danger to his life; then think of his deafness.

I. So in acute otitis media, the earlier a bulging membrane is incised, the better it is for the patient's safety, and also for his hearing. Similarly, one should not hesitate to open and drain a definitely infected mastoid.

II. Even in chronic suppurative conditions with an infected mastoid, taking the safety of the patient into consideration, correct advice is for a radical mastoid which involves certain amount of further risk to hearing. But in practice, the classical radical operation, converting the mastoid and meatus into a single cavity is reserved for those cases which have almost lost their hearing. If there is still some useful hearing, a modified radical operation is done, without damaging the mucous membrane covering the inner tympanic wall. All the same, one should give a very guarded prognosis here, though in some cases good hearing is retained even after the radical operation.

In this connection, it is worthwhile to remember that there are cases of chronic suppurative otitis media without the mastoid being infected. Probably, the source is through the Eustachian tube from the nasopharynx. Naturally, a mastoid operation is strongly contra-indicated; palliative measures have to be relied on, to prevent relapses. After setting the ear right, it is advisable to remove the source of sepsis in the sinuses, teeth or tonsils. The after treatment in suppurative condition consists in placing a thin film of cotton wool soaked in paraffin against the perforation, or to inner tympanic wall (the so-called artificial drum),

after making sure that the discharge has completely disappeared; and further treatment is as for permanent deafness pointed out below.

B. In non-suppurative middle ear obstruction, which is mostly due to obstruction of Eustachian tube by swelling, with or more frequently without, catarrhal exudate, the first step is to relieve the tubal obstruction by removing any fluid in the tube or middle ear by aspiration through an Eustachian catheter. If there are tubal adhesions, bougies have to be passed through Eustachian catheter. Then, the middle ear is inflated through the same catheter. Treatment of Eustachian tube should be continued until it is clear, and later, any source of nasopharyngeal irritation should be dealt with by sprays, gargles, inhalations or even surgically, to prevent relapses of tubal infection, only if there are precise indications for the same. A simple fear of relapse, should not lead one to haphazard surgery, disproportionate to the inconvenience of the condition. It may be laid down that in true middle ear (non-suppurative) deafness, once the potency of the tube has been restored, no nasopharyngeal surgery is likely to further improve the hearing. Sometimes, in long-standing obstruction, all attempts to reopen the tube may fail.

III. Nerve deafness:—The prognosis here is definitely worse than the above condition, except where there is a curable cause, such as syphilis, and many toxic cases—endogenous, exogenous, drugs, vascular deafness, etc. But, administration of Salvarsan should be done with the greatest caution, as reaction to treatment causes vertigo and increase of deafness. Regarding other varieties of nerve deafness, such as hysterical and psychogenic, etc., treatment is on general lines, viz., isolation and suggestion, etc., by a mental expert. Tumours of VIII nerve have to be removed if possible. In deafness due to mumps, cerebro-spinal meningitis and labyrinthitis, recovery is rare. For senile, and arterio-sclerotic deafness, nothing beyond an ear trumpet or even one's own hand held behind the auricle, can be advised.

IV. There are some cases of permanent or advanced deafness, which include (a) progressive middle ear catarrh, with an adhesive process of the ossicles, and indrawn tympanic membrane, where the prognosis is very bad and the deafness is sure to increase. Invariably, one finds a chronic nasal obstruction or septic tonsils in these patients. The deafness persists even after the patency of Eustachian tube has been restored; (b) otosclerosis is another condition of permanent deafness which defies all treatment. Various drugs have been recommended such as Sodi.iodide 2 to 5 gr. for 3 days, to be repeated after a month's rest: Phosphorus 1/60 gr. in a pill form, or as Glycero-phosphates; corrosive sublimate and bromides for the accompanying tinnitus; galvanism (+ ve pole applied to the ear and - ve over the neck), blister over mastoid, or even operative destruction of cochlea. Various ductless glands, especially thyroid pituitary and adrenal bodies, have been tried to benefit the pathological spongy bone formation in the ossicles. Some cases seem to be benefited by the intra-tympanic injection of Thyroxine. Further, diathermy and injections of fibrolysin, massage of the membrane and ossicles, mobilization and extraction of stapes, local application of X-rays and radium, have to be mentioned only to say that they all have been proved to be useless. An autogenous vaccine from nasopharyngeal secretion is believed to arrest the progress of the disease for sometime. It is imperative that we should advise these patients to avoid excessive use of alcohol, meat, tobacco, tea

and coffee, noisy surroundings, great bodily and mental fatigue, and exposure to cold. Particular attention should be paid to vascular conditions, such as iron and arsenic in anæmic cases. Too low or too high a blood pressure is said to be deleterious. In an established case of otosclerosis, any nasopharyngeal surgery is absolutely harmful. Finally, lip reading or artificial aids to hearing is the best advice. As prophylaxis, however, otosclerotics should be warned against the deleterious effect of pregnancy, and its hereditary tendency among their progeny.

V. For deaf mutism, as prophylaxis, we should always discourage marriage of deaf mutes. Acquired deaf mutism can be prevented by prompt and thorough treatment of any inflammatory condition of the ear. For the rest, the correct treatment is to educate the child in a deaf and dumb school, under expert guidance, at least to enable it to communicate with others, and to be self-supporting in adult life. Education may be (1) oral (lip rearing) ideal method, but useful only to those who have some remains of hearing, *i.e.*, semi-deaf and semi-mute, and who are not mentally defective. It should be begun before the age of 3 or 4, and takes about 8 years. For the slightly idiotic and complete deaf mutes (2) the other manual (or finger spelling) method is the only chance. Details of these methods are beyond the scope of any aural surgeon; (3) a third method which can be tried at home by the mother, is to speak to the deaf child while facing a mirror and holding her mouth very close to its ear. The child can see her lips and also hear her voice, presuming that it has some islands of hearing left. This method depends on the principle that the force with which sound waves impress the hearing mechanism, varies inversely as the square of the distance from the source of the sound to the ear, *i.e.*, 1 yd : 1' :: 1 : 1296; (iv) the most recent method is by the use of artificial aids to hearing.

Treatment of deafness will not be complete unless we mention a few words about various aids to hearing: They are (1) *lip or speech reading*: In expert training schools, especially useful for younger and adult patients with progressive deafness, *i.e.*, otosclerosis. It is a failure in elderly people. For such cases (2) *non-electrical*: (a) a speaking tube for ordinary conversation, with an ear piece in the patient's ear, and a wide funnel for the speaker, both being connected by an India-rubber tubing. This is not useful in public lectures, theatres, and further, it advertises the patient's disability. To avoid this (b) celluloid auricles or fan-shaped audiphones are worn beneath the hair, especially by lady patients; (c) artificial drum made of fine leather or silk with a thin metallic handle to facilitate its removal, is worn in cases of dry perforation, the simplest being a thin film of cotton wool soaked in liquid paraffin; (3) *electrical*: (a) The micro telephone has the disadvantage of producing much secondary noise. It is useful for deafness of middle tones; not so useful in senile and nerve deafness, where the upper tones are affected; (b) value amplifiers are useful for high tone loss, though they are rather bulky. In this connection, it is important to remember that a hearing aid should never be chosen at random and never be bought without a period of trial at the patient's house. During recent years, deaf people are re-educated by means of an electrophone of Zundt Benguet, and Kinisiphone of Maurice. PHILIP FRANKLIN has invented an audio-amplifier tube along with a teletactor, which arrangement is supposed to amplify the sound, and especially useful to educate the deaf mutes,

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(Continued from page 593 of Oct. 1944 issue).

Chapter XIV.

I. Prevention of urinary suppression after intravascular hæmoly-sis. (Such as may occur in blackwater fever, Sulphonamide therapy or mismatched blood transfusions).

The treatment recommended is based on the work of BUSHBY, KEKWICK, HART, and WHITBY in the *Lancet* of 24-2-40. They show that, for the purpose of promoting diuresis and alkalisation of the urine, it is simpler to give citrates by mouth and "I.V." than the old method of using bicarbonates in order to prevent the deposit of acid hæmatin in the kidney tubules.

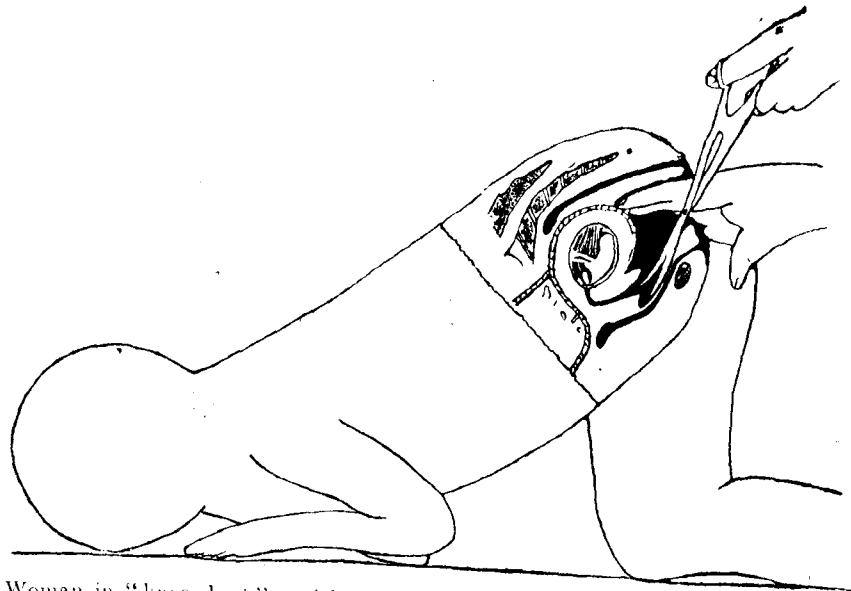
1. Oral treatment is governed by the necessity of giving the patient 3,000 c.c. (=105 oz.) of fluid plus 35 grammes (=540 grains) of Citrate every 24 hours until all danger is over. The oral treatment is to be preferred if practicable.

As soon as intravascular hæmolysis is suspected, a single dose of 8 grammes (grains 124) of Potassium Citrate must be given. This will render the urine alkaline within half an hour. During the next twenty-four hours 27 grammes (416 grains) of Potassium Citrate must be given dissolved in 2,000 c.c. (70 oz.) of fruit juice and water. Instructions must be given that this Potassium Citrate mixture must be completely consumed. Besides this Potassium Citrate mixture the patient must take at least 1,000 c.c. (35 oz.) of other fluid. After the first 24 hours alternative flavourings may be used in the 2,000 c.c. (70 oz.) of Potassium Citrate mixture. A generous solid diet contains 1,000 c.c. (35 oz.) of fluid and should the patient be unable to take a solid diet the fluid must be given alone. This will make the total fluid intake per day 3,000 c.c. (105 ozs.). Potassium Citrate 35 grammes (grains 540) given in the same way must be taken every twenty-four hours until hæmoglobinuria has ceased. In unconscious patients 35 grammes (540 grains) Potassium Citrate in 3 litres (105 oz.) of water can be given by drip feed through a Bailey's or Ryle's tube passed through the nose into the stomach or by an ordinary stomach tube. Should the symptoms of alkalosis appear, the administration of Potassium Citrate should be stopped for six hours or until the symptoms have disappeared, and then be restarted. The symptoms of alkalosis in the early stages are lassitude, giddiness, and headache; later, vomiting and muscular cramps occur.

Since urinary methæmoglobin has a brownish tinge and unchanged hæmoglobin is bright red, the change of colour will afford a valuable clinical index of urinary pH. While the urine is bright red the reaction is alkaline. The appearance of a brownish tinge in the urine should be a sign to restart treatment.

2. When oral administration is impossible, intravenous treatment is required. Sodium Citrate 18 grammes (=grains 280) and Glucose 120 grammes (1852 grains) are administered by intravenous drip every twenty-four hours until the disappearance of hæmoglobinuria. A 5% solution of

Glucose and a 3% solution of Sodium Citrate are prepared and sterilized separately. As soon as intravascular hæmolytic is suspected, 150 c.c. of the 3 per cent. solution of Sodium Citrate (4.5 grammes or 70 grains) should be administered immediately, if necessary, using a syringe. This will render the urine alkaline. Next, 450 c.c. of the Citrate solution should be added to 2,400 c.c. of the Glucose and a continuous drip should be established, the total volume of fluid, 2,850 c.c. being given during the



Woman in "knee-chest" position for replacement of retroverted Gravid Uterus.
[Vide Chapter XI, Section II, Treatment (7), page 535 of Sept. issue.]

first twenty-four hours, and a further 3,000 c.c. (600 c.c. of 3% Citrate solution mixed with 2,400 c.c. of 5% Glucose solution) being given every 24 hours until the sufferer can drink sufficiently.

If pyrogen-free water is not available for making up the solution the basic (105 ozs.) 3 litres of fluid will have to be given by a combination of Murphy's continuous rectal method and subcutaneous infusion. The 18 grammes (280 grains) of Sodium Citrate will have to be boiled with 100 to 200 c.c. (3 to 7 ozs.) of distilled water. 4.5 grammes (70 grains), which is $\frac{1}{4}$ of the total must be given immediately "I.V." and the remainder given "I.V." but distributed as evenly as possible during the 24 hours. (Messrs. Kemp and Co., of Bombay used to supply ampoules containing 2 grammes of Sterile Sodium Citrate). The 24 hours supply of 120 grammes of Glucose can be given out of ampoules containing sterile 50% Glucose solution, which is now put up by a number of reputable firms. The total quantity will be 240 c.c. in 24 hours spread as evenly as possible. The giving of the Glucose is not as vital as the giving of the Citrate. The same quantities of Citrate and fluid are required every 24 hours until all danger is over. As soon as the patient can swallow, the intravenous method should be replaced by the oral method.

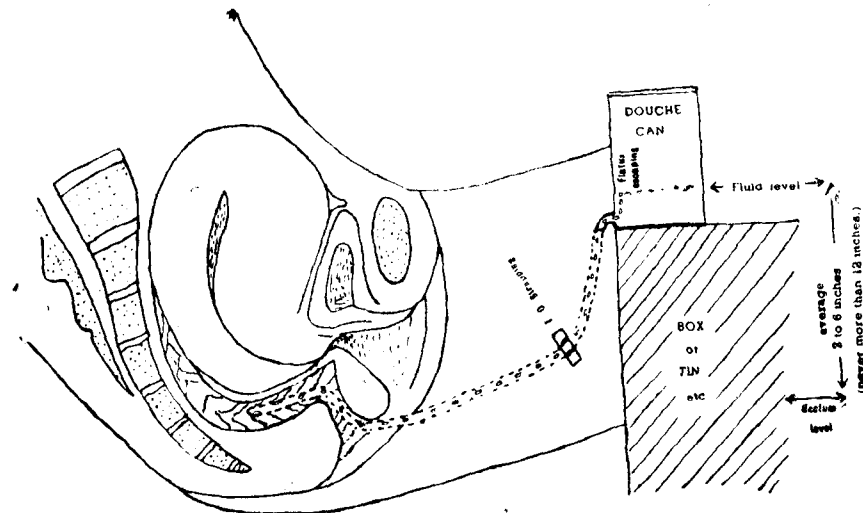
3. The exact quantities ingested and the urinary output must be measured and charted.

II. "Murphy's method of proctoclysis."—When a patient is unable to retain sufficient fluid by mouth and pyrogen-free water is not available

for intravenous therapy recourse must be had to the subcutaneous (hypodermoclysis) and rectal routes (proctoclysis). Every one is familiar with the method of giving saline under the breasts or into the flanks. Very few people comprehend the proper manner of ensuring satisfactory continuous and prolonged absorption of fluid from the terminal gut. Plain

J. B. MURPHY'S METHOD OF PROCTOCLYSIS

Section showing a Puerperal Pelvis receiving continuous rectal infusion



water is absorbed more rapidly and satisfactorily than Saline or Glucose solutions.

In village practice it is important that the water employed should be as free as possible from mineral and organic matter.

1. The apparatus required is—

(a) An "E.I." or other douche can, or any glass or rubber douche reservoir, etc.

(b) A stand for maintaining the reservoir upright.

(c) Rubber tubing of fairly large calibre.

(d) Possibly a glass connecting piece of equally wide bore.

(e) A nozzle of glass, rubber or vulcanite to fit into the rectum. This nozzle must have at least one large opening or three or more smaller openings (i.e., vaginal douche nozzles, 'dePezzer' catheters, flatus tubes, stomach tubes). To avoid leakage back past the anus, the original Murphy's angled glass nozzle with bulbous tip is superior to all others.

It is necessary to have an obtuse angle flexure 2 to 3 inches from the tip of the nozzle unless the rubber is very soft in order that the nozzle may lie comfortably in the ano-rectal bend.

2. Technique:—

(a) The woman may be in any position from Fowler's to Sim's with either the head or foot of the bed raised. She may change her position provided the apparatus is suitably re-adjusted.

(b) Before commencing, the rectum and colon must be emptied of

all faecal matter by means of a plain water or normal saline wash out. *This is of vital importance for success.*

(c) The temperature of the fluid should be 100°F. as it reaches the rectum.

(d) The base of the reservoir should not be more than 2 to 6 inches above the level of the anus.

(e) The height of the fluid in the reservoir regulates the rate at which the fluid enters the rectum and it should not exceed a height of 12 inches above the anus. Usually 4 to 6 inches is sufficient.

(f) The rate of flow of fluid into the rectum should never exceed from 2 oz. (60 c.c.) to 3 oz. (90 c.c.) in 5 minutes. Many patients will not tolerate more than $\frac{1}{2}$ oz. (15 c.c.) in 5 minutes. The rate is regulated by raising or lowering the reservoir and/or the level of the fluid in the reservoir, the rate of flow *must not* be regulated by clamps, forceps, or knots, etc., on the tubing.

(g) Flatus and fluid must absolutely be free to pass from rectum to reservoir and this is the reason for having fairly large caliber tubing and eliminating all pinchcocks, etc.

(h) The tubing must be strapped to the thigh in such a way that *no* pressure is produced upon the rectal walls, especially the posterior wall.

(i) Improper position of the tube, frequent removal and re-insertion of the tube, and overfilling the rectum with fluid are distressing to the patient and irritating to the anus and rectum. Intolerance is thus induced and partial or complete evacuation of the rectal contents results.

(j) An expert with this apparatus can obtain an average absorption rate of 15 pints (8.5 litres) in 24 hours, without the rejection of any fluid.

(k) Murphy considered that less than 7 pints (4 litres) in 24 hours was of little therapeutic value. On the other hand, too much fluid especially if normal Saline is used, may result in oedema after the 3rd or 4th day though such an occurrence is most unlikely and is easily remedied by reducing or stopping the flow of fluid for a time.

(l) Proctoclysis properly performed by this method can easily be maintained for 2 or 3 days and even up to 5 or 6 days.

(m) In peritonitis the institution of proctoclysis with normal Saline solution is of great therapeutic benefit, especially if the fluid reaches the rectum continually at a temperature between 100°F and 110°F.

(n) Proctoclysis need not be interrupted during sleep.

(o) Potassium Bromide and Chloral Hydrate, of each 20 to 30 grains, can be added to a pint of water and included in the fluid intake. If Bromide is being given avoid giving Saline solution in order to obtain more rapid and profound action of the Bromide.

(p) A saturated solution (0.8%) of Sulphanilamide can be given by this method. Crush 7.5 gramme (15 tablets) or use crystalline Sulphanilamide and add one pint (570 c.c.) warm water, shake up well and allow to cool. The supernatant fluid contains 1 gramme of Sulphanilamide in each 125 c.c. ($4\frac{1}{4}$ oz.) The required dose should be added to the water in the reservoir at proper intervals of time according to the scheme of dosage.

III. "Alternative routes for giving sterile normal Saline solution."

1. The peritoneum will easily absorb 1000 c.c. (between 35 and 40 ozs.) of Sterile Normal Saline. Injection can be repeated in an emergency as often as necessary.

2. The Cave of Retzius will accept 1,000 c.c. (between 35 and 40 ozs.) of Sterile Normal Saline in 10 minutes. The needle is inserted just above the pubic symphysis and the point is advanced close to the posterior wall of the symphysis. The bladder will not be entered if reasonable care is taken.

IV. Whole Blood Serum or Plasma transfusion.—It is not difficult to give a whole blood, serum or plasma transfusion even without all the paraphernalia of a special service, though it is easier if one possesses them.

For whole blood the minimum requisites are:—

(a) $\frac{1}{2}$ oz. Sodium Citrate or 30 ctg. Neoarsphenamine.

(b) 50 c.c. Sterile pyrogen-free water or a couple of 25 c.c. ampoules of Sterile Glucose solution made by a reputable firm. (100 c.c. of fluid is however better).

(c) One or two wide bore serum needles such as French's proper collecting needles and a Weintraud's or any good needle or canula for administration. The bore of needles must be absolutely smooth to ensure an easy flow of blood. Many needles appear to have a rough bore and this obstructs the easy flow of blood, which is so desirable.

(d) Approximately 5 feet of rubber tubing to fit the needles or canula.

(e) A jug or glass holding 24 ozs.

(f) A glass or E. I. douche reservoir or glass funnel. It is of advantage to have a drop counter and an adjustable pinchcock such as Hoffmann's.

For collecting connect a needle to 8 to 12 inches of rubber tubing and tie it tight.

For administering connect a needle by about 4 feet of tubing to the douche reservoir or glass funnel. If you have the drop counter and pinchcock interpose them about 6 inches from the reservoir, being careful to have the pinchcock below the drop counter.

While the above are being boiled in several pints of the cleanest water available to which $\frac{1}{2}$ oz. of Sodium Citrate or 15 ctg. of Neoarsphenamine have been added, take a few c.c. of blood from the stricken woman and allow it to clot or allow one or two c.c. to clot. Add the rest to a little citrate solution. When the serum separates from a clot, place some of this serum on a piece of clean glass. Prick the finger or ear of a donor, who must be free from malaria, syphilis, etc., and quickly removing a tiny drop of blood from the prick mix it with the serum or draw a few c.c. of blood from the proposed donor. Allow 1 or 2 c.c. to clot. Add the rest to a little citrate solution. Do not confuse the recipients with the donor's blood samples. Test the serum of the recipient against the citrated red cells of the donor. Rock the glass gently for ten minutes and mix the blood and serum. Examine the glass in a strong light placing it first on a white background and then on a black background. (A lens is helpful if you have one). If there is *no* agglutination, i.e., clumping of the

red cells in little masses the donor is suitable. If there is agglutination test another donor. If there is time it is just as well to test the donor's serum against the recipient's citrated red cells as an additional precaution. If there is any agglutination select another donor.

In the collecting jug place 50 c.c. or 100 c.c. of the pyrogen-free water or Glucose solution to which has been added 45 grains (3 grammes) of Sodium Citrate or 15 cgt. Neoarsphenamine. If the Sodium Citrate is not out of a sterilised ampoule it should be boiled with 5 c.c. of water before adding to the fluid in the collecting jug.

When you have a suitable donor make him lie down and choosing the arm with the best vein let it hang down over the side of the table for a few minutes before you apply the sphygmomanometer cuff as high up as possible. (If you have no sphygmomanometer a lightly tied tourniquet will do). Clean the skin in the bend of the donor's elbow and make him open and close his fist until the veins stand out well. If the veins are too small make the donor hold his hand in a jug of hot water for 10 minutes. Place the donor's arm on a chair with a roll of cloth or something underneath to hyper-extend the elbow slightly. Seat yourself comfortably. Inflate the sphygmomanometer to about 50 m.m. Hg. Thrust the collecting needle into the selected vein, as though about to give an injection of Neoarsphenamine, and when the blood flows freely, the free end of the tubing is placed in the collecting jug. The blood thus flows steadily into the Citrate solution, which is shaken occasionally, until 1 pint of blood (20 ozs. or 600 c.c.) has been added to the Sodium Citrate or Neoarsphenamine solution. If the blood flow lessens make the donor open and close his fist. The operator must steady the needle during the whole procedure of collection. If the flow of blood ceases while the donor is still in good condition the needle has become blocked. Remove the needle and tube; clean it thoroughly with the stilette. Reboil it in citrate and puncture another of the donor's veins. If you only obtain 10 or 15 oz. of blood it is much better than none at all.

The blood is now given to the patient by the gravity method, just like Roger's intravenous saline, using either a needle or a canula. In order to avoid wasting blood it is better to commence with some Saline or Glucose solution (if you have any) and when this is running smoothly to add the blood to the reservoir. Cover the reservoir with a sterile cloth. At about 200 drops a minute it will take an hour for a pint of fluid to gravitate into the recipient. If you have no drop counter just regulate the speed by the height of the reservoir. After a severe hæmorrhage a pint of blood can be administered in 20 minutes or half an hour without harm. For infants give 10 to 15 c.c. of blood per pound of body weight slowly.

In collapsed cases and in infants remember the saphenous vein just above and in front of the medial malleolus or in adults the manubrium sterni or in children the tibia as good sites for blood transfusions and other infusions. It may be necessary to cut down on a vein as described below.

The above is neither difficult nor theoretical. I have done it with success but of course it is of great advantage to have special equipment and above all to know by heart all the hints and tips contained in the first three chapters of Hamilton Bailey's "Emergency Surgery."

Dried Serum or Plasma can be reconstructed by the addition of pyrogen-free water, 5% Glucose or normal Saline and given by the gravity method as described above.

If the donor has veins which are difficult to enter with a needle, or if the blood will not flow freely from the needle, it will be necessary to inject some 1% sterile Novocaine around the best vein. Boil up in Citrate solution or Neoarsphenamine solution an intravenous canula with 8 to 12 inches of rubber tubing attached. Cut down on the vein by a short transverse incision. Introduce the tips of blades of a hæmostate forceps into the wound and by opening them several times clear the subcutaneous tissues from the vein. Run an aneurism needle under the vein and pass two catgut ligatures. Tie off the lower one and by making gentle traction on the ends draw up the vein. Make a small transverse niche in the wall of the vein and pick up the proximal margin. Slip in the tip of the canula and with the other ligature tie in the canula thus ensuring free flow of blood into the collecting jug.

K. C. GHARPURE has had success in difficult cases by feeling for the femoral artery immediately distal to the inguinal (Poupart's) ligament. The saphenous vein lies immediately medial to the artery and with a finger on the artery the vein can be entered by passing the needle through the skin to the medial side.

I have given small children intravenous anæsthetics into the external jugular vein as it emerges from the lateral border of the sternocleidomastoid muscle. When children cry this vein stands out prominently. I have not yet tried it for a transfusion but I give the suggestion for what it is worth.

Patients sometimes suffer from rigors and high fever during transfusion. This is no indication for stopping the transfusion but the rate should be slowed. If however the patient suffers from a bursting feeling in the chest, violent pain in the lumbar region, or severe headache, the transfusion must be stopped immediately and the suggestions made in (I) above adopted because the donor's blood must be unsuitable to the recipient. A sample of urine should be examined immediately for hæmoglobinuria.

The method of blood transfusion described above is not to replace standard practices, where such are available. The open method always risks contaminating the blood with air born bacteria, etc.

It is to be hoped that after the war is over the Standard pattern transfusion and infusion apparatus will be available to all and that full instructions for drawing blood and giving blood by the closed method together with details of sterilization, etc., will accompany each set. (Messrs. Bengal Chemical and Pharmaceutical Works produce ampoules of Sodium Citrate solution. Messrs. Bengal Immunity, Ltd., supply ampoules of Novocaine).

V. When the veins are not available bone marrow can be used as a site for the reception of infusions, transfusions and anæsthetic agents. Rigid asepsis is essential for this method. In the mother the most convenient site is the manubrium sterni just above its junction with the gladiolus. In the infant the tibia is selected. Sternal puncture is a simple procedure which is daily performed in India for the diagnosis of

kala-azar and the anæmias. The special needles with a stop on them, such as Witts' sternal-puncture needle, are of advantage but any short bevel, stout, wide bore needle or small trocar and canula will do, such as a lumbar puncture needle or an ordinary intravenous needle. A sharp hydrocele trocar with canula would be better, provided the connections are suitable.

In a patient who is shocked and/or exsanguinated it may be a matter of great difficulty to find a suitable vein working at night in a small hut by the light of an oil wick. Under such circumstances it is possible to get fluid into the sufferer by giving normal Saline subcutaneously and 5% Glucose intramedullarily if blood or serum is not available. Dried serum should soon be on the market. It can be reconstituted by the addition of pyrogen-free distilled water or Glucose solution.

There are two dangers:—(a) Osteomyelitis, which can be obviated by thorough asepsis and by nicking the skin with a scalpel point at the spot selected for the insertion of the needle. The point of the needle is then made to enter the subcutaneous tissues through the gap in the skin, without touching the skin, and thus avoids the danger of carrying in staphylococci, etc., from the skin on the needle point.

(b) Perforation of the posterior plate of the sternum, which is very easy in young Indian women (I have done it myself). No harm results if the accident is recognised and the needle is withdrawn into the marrow cavity before any fluid is injected. The procedure is probably as safe as using the superior longitudinal sinus in infants.

I have not found it as easy to obtain a generous sample of marrows in a syringe as some authorities describe and in one case I completely failed to give blood by intravenous or intramedullary routes.

In an emergency with the woman well under morphine and semicomatose from shock the local anæsthetic may be omitted if not available. In the infant too the anæsthetic may also be omitted if necessity demands it, but the infant should be given $\frac{1}{2}$ grain of Chloral Hydrate in water if possible. A Witts' or serum needle should be used for an infant and it should be fixed in such a manner that no pressure on the skin results. A better needle is made by Allen and Hanbury's to the design of Miss Janet GIMSON. The $\frac{1}{4}$ inch size is suitable for the new born.

MR. HAMILTON BAILEY has kindly given me permission to quote his technique and reproduce his illustrations from the issue of the *British Medical Journal*, dated 5th February 1944.

"The patient lies prone. A wheal of local anæsthetic is raised on the skin in the middle line just above the manubrio-gladiolar junction. Using a large but short hollow needle, the point is driven right on to the bone and about 2 c.c. of 1% solution of Novocain is infiltrated. This subperiosteal infiltration is an important detail. The area is then massaged with a swab so as to disperse the anæsthetic and enable one to feel the manubrio-gladiolar synchondrosis. After nicking the skin as described above the trocar and canula is inserted just above this ridge (Fig. 1 *vide page 647*) and pointed almost directly downwards towards the floor, but with a very slight inclination towards the patient's head. An unhurried boring motion is imparted to the instrument. The pressure, at first slight, is increased. The feeling that the outer plate has been penetrated is unmistakable."

accomplished, the angle of the instrument is altered and the point is directed towards the patient's head. The wings do the rest. They ensure that the correct depth has been reached, they set the correct angle, and they prevent too deep penetration (Fig. 2). The trocar is removed. The next step is to take a 10 to 20 c.c. record syringe half full of 3% Sodium Citrate solution, which is in readiness. The syringe is affixed to the canula and some of the citrate solution is injected. The piston is withdrawn. If what appears to be blood (it is red marrow) is easily and liberally withdrawn so that it colours the whole of the contents of the syringe (Fig. 3). The extremity of the canula

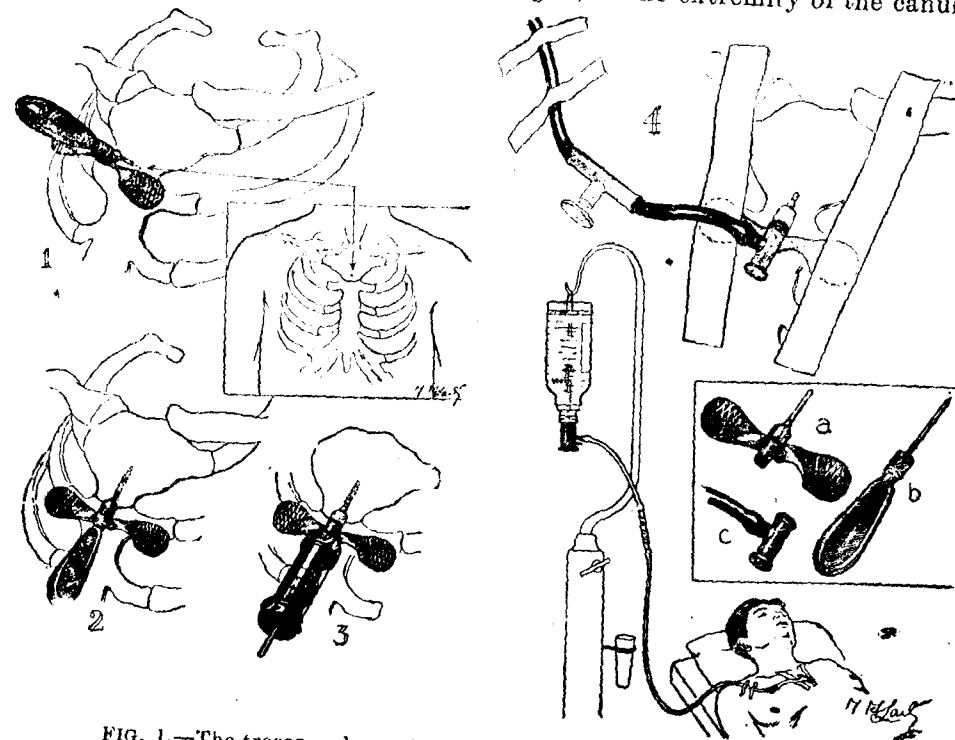


FIG. 1.—The trocar and canula about to enter the manubrium.

FIG. 2.—The medullary cavity entered.

FIG. 3.—Having injected a small amount of citrate solution, the piston is withdrawn, and if red marrow is easily and liberally aspirated the extremity of the canula is correctly placed within the marrow cavity. This step is fundamental.

FIG. 4.—The canula is linked to the infusion apparatus.

(By kind permission of Mr. H. Bailey and courtesy of *Brit. Med. Jour.*, 5.2.44.)

is correctly placed within the marrow cavity. If the flow of marrow is not entirely free, the trocar is reinserted into the canula, which is then very slightly withdrawn and another attempt to aspirate marrow is made. When entry of the tip of the canula into the marrow cavity is undeniable, more citrate is injected and the syringe is disconnected. Quickly the canula is linked with the infusion or transfusion unit, the tubing of which has been previously demonstrated to be free from air bubbles. Strips of adhesive plaster of an appropriate width are used to fix the wings to the chest wall, and narrow strips of the same material are placed to steady the attached tubing at the correct angle (Fig. 4)."

If the blood will not flow into the medullary cavity it is necessary to raise the pressure, which can be done by raising the bottle or reservoir as much as six feet above the needle or by using a sterilised enema syringe to pump air into the bottle of blood. In this latter case a filter of sterile cotton wool should be interposed between the enema syringe and the blood. Alternatively a cavity in the marrow can be cleared by filling a 20 c.c. syringe with normal Saline or 3% Sodium Citrate solution or with distilled water in which 0.15 gramme of Neoarsphenamine (N.A.B.) has been freshly dissolved and forcibly injecting the whole 20 c.c. into the medullary cavity of the sternum. I have found this a very painful procedure and advise a light anæsthetic of chloroform, ethylchloride or nitrous oxide for the patient during the injection into the sternum.

In MR. G. BEHR's experience with infants he finds that a heavy flanged trocar or weighted needle pressing on the skin may produce necrosis and that after two or three days the needle or canula will become loose and must be removed to avoid the risk of osteomyelitis. He finds a 'naked' needle or short bevel canula with the handle fixed to the trocar satisfactory. Actually a lumbar puncture needle or Witts' needle or serum needle will do. After nicking the skin as described above, the needle or canula is introduced through the gap in the skin, without touching the skin, on the antero-medial aspect of the tibia just below the tuberosity and no fixation is necessary. A sterile dressing should surround the needle. The infant's leg and possibly its body should be fixed on a light well-padded splint with a cross piece to prevent rotation of the leg. MISS JANET GIMSON stresses the importance of semi-externally rotating the tibia of the infant in order to facilitate the introduction of the needle at right angles to the surface of the tibia. For the infant the reservoir of blood may have to be raised six feet above the needle or 10 c.c. of Normal Saline solution may have to be injected before the blood will flow.

Some Observations on Famine Dropsy in Hadhramaut*

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DURING the last two years I have come across hundreds of cases of famine dropsy which have broken out in this part of the world due to:—(1) Financial crisis after the fall of Singapore and Java where the majority of the people have invested their money; (2) stoppage of import of food-stuffs from outside; and (3) lack of rain during the last 3 years.

Hadhramaut, as you see on the map, is a part of Eastern Aden Protectorate. The climate of the interior is dry and hot, the maximum temperature 105°F (in shade) and lowest in winter recorded by me was 44°F. Days are very hot but nights cool and comfortable. Average annual rainfall is 2 inches. The villages and towns are situated in a broad valley (*wadi*) where there is plenty of water in the wells but the soil is very bad for good agriculture. Dates grow very well and if the floods come down from the mountains twice or thrice a year, there is sufficient annual date crops for local consumption. Jowari and wheat

* Specially contributed to 'The Antiseptic.'

are also grown in some parts but on the whole agriculture is not profitable to the farmers.

The average class (Muskin) namely farmers and working class used to consume daily the following sorts of foodstuffs which were abundant before the crisis occurred:—About 2 lbs. of dates, jowari or wheat, dried shark and vegetables such as onions, turnips, brinjals, coffee with sugar. Only rich classes (Sayyids and rich merchants) could afford to eat rice and in this class famine dropsy has not occurred.

During the present scarcity of food the working classes live on a bit of jowari and a kind of grass (alfalfa or lucerne) which is used for cattle and goats.

The disease started in the northern end of the *wadi* and began to spread westwards till the whole of the *wadi* was affected with the result that hundreds of cases migrated towards the coastal area, particularly to Mukalla, the capital of Hadhramaut.

Age.—Most common between 10 and 40 years; but no age is exempt. I have seen it in many sucklings where mothers were also swollen with hunger.

Sex.—Both sexes are attacked. Weak and robust are equally susceptible.

Season.—Epidemic drops down in the months of June, July and August in the period of dates crop season.

Symptoms.—The disease starts with attacks of mild diarrhoea with mucous and sometimes blood and may resemble dysentery. Oedema appears first in the legs and gradually spreads upwards ultimately involving the whole body. Ascites rarely occurs in large quantity. Oedema is neither painful nor tender, but sometimes the skin on the feet bursts with serious exudation and secondary sepsis may supervene. In children below five years oedema first appears on the face and then very rapidly the entire body is affected.

There is muscular weakness but without any rigidity or tenderness of calf muscles. There is usually dimness of vision and the sexual impulse disappears. Mental depression is found in all cases.

There is not much breathlessness compared to the oedema and the patient carries on his routine hard work without much difficulty until his condition gets very bad. With the appearance of oedema bowels get constipated.

Physical examination.—Albumin is not detected in urine until oedema appears on the face. Temperature is always normal. Pulse is weak, rapid and irregular, volume and tension being lowered. Cardiac atrophy is more common than enlargement and dilatation. With the enlargement and dilatation of heart, the first sound in the mitral is accentuated with systolic murmurs. Further signs of cardiac failure appear with the progress of the disease.

Treatment.—Vitamin A & D (Cod liver Oil), Vitamin B, (Berin) Nicotinic acid, Vitamin B complex and Vitamin C have no effect whatsoever, administered either separately or combined, on the progress of the disease. Meat and sufficient quantity of jowari had no satisfactory results. Rice

and a good amount of sugar (even intravenous injections of Glucose) when given had no good effect on the oedema. But the addition of dates to the diet has a wonderful effect on famine dropsy, so much so that in a majority of young cases (not extreme cases) the oedema disappears within 15 days by addition of dates to the diet (average 12 ozs. daily). Tr. Digitalis and other drugs may be given as a routine but are rarely useful. In extreme stages nothing can be done.

Comments.—There are three theories for the causation of famine dropsy, namely: (1) that there is an infecting organism or virus; (2) that the disease is due to intoxication by diseased rice or adulterated mustard oil with Argemone Mexicana; and (3) that it is an avitaminosis.

All these theories are not worth discussing as far as at least as famine dropsy in Hadhramaut is concerned.

The disease occurs mainly amongst working classes ('Muskin') who rarely eat rice whereas the rich rice-eating class escapes it. Mustard oil is not known to these Arabs and hence the question of poisoning by Argemone Mexicana does not arise.

The theory of 'conditioned toxicity' is not quite simple and clear cut.

How the dates act and improve the condition of the patients is for others to investigate. If it was due to the sugar content in it, the other forms of sugar or intravenous Glucose could have alone diminished oedema. As stated above, all sorts of vitamins in the form of tablets and liquid had no effect on the progress of the disease. The poor in Hadhramaut are well protected from scurvy by Vitamin C content in the grass (Alfalfa) they consume. By the by, I know the recent outbreak of scurvy in one institution where the occupants were not getting vegetables and grass was not available to them and their diet consisted of fish and jowari only. There was typical stiffening and swelling of one or both legs with tenderness in calf muscles. In some there was swelling of ankle and knee joints. I observed them walking on tips of their toes due to the rigidity of the calf muscles. With the administration of Vitamin C and addition of fresh vegetables and lemons to their diet, the oedema and stiffening of the legs together with the purple colour of the gums disappeared. No stiffening of calf muscles occurs in famine dropsy.

In conclusion I think it is quite likely that the semi-starving tissues, due to deficiency of diet in general and not due to any particular factor or external poison in the diet, themselves liberate a large amount of histamine-like substance which causes the characteristic 'dilated and engorged capillary angiomatous condition' of the whole body, thus ultimately producing the typical picture of famine dropsy.

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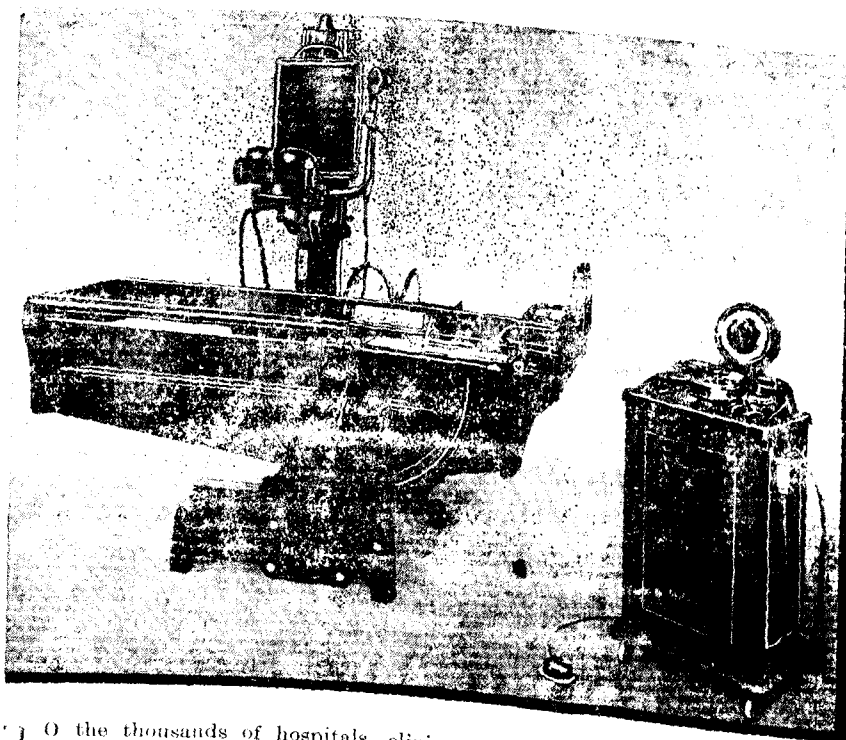
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Some Aspects of Acute Abdomen in Children*

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ACUTE abdominal conditions occurring in children show certain differences when compared with those found in adult life, and these differences have an important bearing upon the way in which such cases should be handled.

Firstly, a child shows in the presence of any serious illness, great constitutional disturbances. Children show a rise of temperature out of all proportion to the cause. Secondly, in children, certain abdominal conditions are nearly unknown, such as new growths, ulcers and perforations of the stomach and the duodenum, and gall-stones; while, on the other hand, intussusception is almost confined to infants, and pneumococcal and streptococcal peritonitis occur with much greater frequency than in adults. And, lastly, the course of acute abdominal disease in children is very rapid. If these points are considered, it is obvious that early diagnosis and early treatment are, if possible, of even greater importance in the case of a child than in that of an adult.

Pain in the abdomen is the outstanding symptom. In ordinary cases, it is in the nature of a colic; it is due to spasmodic contraction of the muscular wall of a hollow viscus and is felt in the region of the umbilicus or all over the abdomen. Such colic may be simply the result of unsuitable food, but in these cases it tends to improve after a few hours.

If the cause is some local inflammation, (e.g., appendicitis) or obstruction (e.g., intussusception), there are other associated signs and symptoms of the disease, and demands serious attention. Intussusception is, as is well-known, by far the commonest cause of intestinal obstruction in babies. There is a rectal discharge of blood and mucous and a sausage-shaped tumour may be felt on palpating the abdomen, and in some cases the invaginated portion of bowel is felt per rectum. Henoch's purpura may simulate intussusception, and is difficult to differentiate. Rectal examination and purpuric spots in the body, if any, may help in the diagnosis. Acute entero-colitis may simulate intussusception. There is usually fever, at best in the early stages in acute entero-colitis, while in intussusception a subnormal temperature is usually present.

Worms usually in children are well-known to have misled many—by simulating acute intestinal obstruction. Microscopic examination of the stools is necessary in every case of acute abdomen, and it must be remembered that finding eggs of round worms does not exclude the possibility of the real cause of acute abdomen being something else.

In acute appendicitis in children, the temperature is usually high. Acute pyelitis may simulate acute appendicitis. In pyelitis, there is pyrexia of the swinging type and convulsions may occur. Microscopic examination of the urine clinches the diagnosis.

Pott's disease may give rise to referred pain in the epigastric region. Herpes zoster may give rise to severe abdominal pain a few days before the appearance of the eruptions. Some cases of malaria may simulate acute abdomen. Blood examination for malarial parasites will reveal the true nature of the disease.

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Certain eruptive fevers such as measles and small-pox may in their pre-eruptive stages simulate acute abdomen.

Certain acute conditions in the chest, *e.g.*, pneumonia, pleurisy, pericarditis may simulate acute abdomen. Hence, it is necessary to examine the chest as a matter of routine while seeing any case of suspected acute abdomen.

Reference :

1. Wakeley—Modern Treatment in General Practice.
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Lathyrism*

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It is only rarely that a medical practitioner, in his practice, comes across cases of lathyrism and so he is apt to be confronted with considerable difficulties in arriving at a proper diagnosis. The onset of the disease in an epidemic form, no doubt, renders the diagnosis a bit easier. The pathological data being almost nil, only a clear grasp of the ætiology and symptomatology of the disease as dealt with subsequently will, it is hoped, prove helpful in tackling such cases.

Lathyrism, better understood by the term 'Khesari-Dal poisoning' is, so to say, one of the blessings conferred to poverty on its worshippers. It is prevalent mostly among poor class of people who are not in a position to afford a better substitute for it. Like other food-borne diseases, it is also the result of the intake of a special article of food known as lathyrus sativus from which the disease has derived its name. It is also known as lathyrism.

Definition.—It is a food poisoning affecting those who live chiefly on the seeds of vicia sativa or other such allied vetches.

Etiology.—1. *Geographical distribution*:—In India, it is prevalent mostly in North Bihar, Central India and the United Provinces. Sporadic cases do occur in Italy, France, Algeria, etc.

2. *Sex*:—Males predominate.

3. *Age*:—Young adults.

4. *Economic conditions*:—Mostly in poor class—especially during scarcity.

5. *Causative factor*:—No definite cause of the disease has been established as yet. Formerly, the intake of lathyrus sativus was said to be responsible for the causation of the disease but researches carried in this direction recently by HOWARDS, ANDERSON and SIMONSEN do not corroborate it. They were unable to demonstrate any toxic substance 'vicine' from vicia sativa commonly known by the term 'Akta' which is an allied vetch and is capable of producing symptoms simulating this disease. ACTON and CHOPRA supported the view later on. According to some, deficiency of Vitamin A in food is the causative factor but no support is forthcoming.

Pathology.—It is believed that toxin thus liberated produces occlusion of the arteries supplying the dorsal region of the spinal cord. And

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perhaps, it is the obliteration of the lumen of the arteries which results in the chronic sclerosis of the cord, thereby involving the posterior and lateral columns which produces the paraplegia.

Clinical manifestations.—1. *Mode of onset*:—May be insidious or sudden.

2. *Early symptoms*: (a) Backache; (b) pain and burning sensation in legs; (c) weakness of the lower extremity, gradually; (d) legs stiff and gait cramped; (e) dimness of vision; (f) exaggerated knee jerks; (g) constipation alternating with diarrhoea, after 10 days, (h) rapid progress of the disease; (i) walking impossible without any aid; (j) development of peculiar gait simulating spastic paraplegia; (k) simultaneous affections of both the lower limbs. First the calves and then the thigh; (l) later on, exaggerated knee-jerks and ankle clonus; (m) sensory disturbances less marked; (n) incontinence of urine and faeces; (o) loss of sexual power; (p) upper extremity not involved.

Prognosis.—This depends on the stage of case-taking. Early treatment yields better chances of recovery but in delayed cases, when the cord is permanently damaged, the spasticity persists.

Treatment.—No specific or curative treatment is known as yet. The treatment is mainly dietetic. Exclusion of 'khesari dal' from the dietary is very essential as the toxin thus liberated produces cumulative action which is very harmful to those already affected. If unavoidable, it should be taken well cooked so that the toxins present therein might be completely destroyed. In addition to the above, liberal intake of vitaminous diet is always advisable. High proteins and vitamins—especially vitamin A—should be given in plenty.

For spastic paraplegia, good results have been obtained by massage. In recent cases, postural measures and electricity have proved beneficial but the long-standing cases are incurable.

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1. Medicine by F. W. Price.
2. Tropical Medicine by Rogers and Megaw.

Something About Cathartics*

VALLABHDAS N. MEHTA, L.M.S.,

Morvi.

OF the numerous medicinal substances in the materia medica which have been used in the various pathological manifestations of the human body, only a comparatively few have proven to be of positive action and of real merit and on the list of honor of these few life-saving drugs, cathartics have found a respectable place. No other remedies have been so widely recommended and so extensively employed by the medical profession as have been cathartics. Unlike all other drugs which have their particular use in certain ailments only, cathartics have been called into service for almost every trouble humans are heir to. One has indeed to strain his mind to single out some morbid condition in which cathartics have been contra-indicated at the onset, during, or at the termination of the illness. The hypnotic is useful in cases of insomnia, the expectorant in certain coughs, the anodyne in painful conditions etc., but cathartics play their role in almost every conceivable trouble under the sun. The

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infant, the child, the youth and the adult all at one time or another have had a taste of this or that cathartic. The latter may truly be said to accompany man from his cradle to his grave. This much cannot be said of any other drugs. In a word, when judiciously, timely, and scientifically used, cathartics serve a very useful and happy purpose.

Unfortunately, however, cathartics more than any other drugs, official or non-official, have been woefully abused by the laity and employed with extreme carelessness. Somehow the people have learned a very wrong and harmful lesson about these drugs. Most of them, even the more intelligent and thoughtful ones, seem to have got the idea that cathartics are perfectly harmless drugs, which can be used without the advice of a doctor at any time and in all conditions. This erroneous notion held by the laity is the key which opens the door to the great abuse and often harmful results of a family of drugs, otherwise exceedingly valuable and useful to mankind.

The young lady, who, one day while posing herself before the mirror to adjust her hair, or perhaps admire her beautiful complexion, happens to notice a few pimples on her nose, face or chin, soon makes up her mind to take some cathartic to purify her bad blood. The woman who takes particular pains not to grow fat, and spoil her shape, often resorts to cathartics to help her accomplish her great desire.

The young man who happens to lose the appetite, perhaps because of staying out too late at night and leading an irregular life, is a frequent visitor at the drug store for some cathartic.

The man or woman with a bad odour of the mouth, a headache, a lazy feeling and what not, is a fine customer of cathartics. In short this remedy finds its way not only into the stomachs of those who really are in need of it, but too often flushes the bowels of those who only imagine it would do them good.

Hundreds of cases could be cited by every observing practitioner showing the abuse of cathartics by the laity.

It is upto the physician of course to spread the knowledge among the people that cathartics are by no means such harmless drugs as they think, and that care in the use of these drugs, and a doctor's advice where to use them, are as important as in other remedies. Until that knowledge reaches the laity the abuse of cathartics will go on.

The time at Which to Take Drugs*

VALLABHADAS, N. MEHTA, L.M.S.,
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A drug acts more quickly, when it is absorbed quickly, and it is absorbed the better when the stomach is empty. All prescriptions in which quickness of action is desired, should come under this rule, and the drug should be taken before meals.

An hypnotic will promote sleep much more quickly, if taken before supper, than if it is swallowed before going to bed. It will act equally well in a small dose as it will be slowly ingested from the midst of a bolus of food. The same thing applies to Cardiac drugs of which the dose is precise and it is wished to estimate the effect.

On the other hand, drugs, the action of which is shown slowly and only take effect by a slow impregnation of the organism, should be given

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at the end of a meal, which, in most cases, will allow a stomach full of food to tolerate them better than when empty. The Iodides and Bromides, Creosote, Urotropin and others should be given in this way. The same thing applied to drugs with a disagreeable flavour.

Some drugs must be given at a time determined by relation to meals. Bitters at least half an hour to an hour before the meal, in order to have time to act upon the gastric secretions. Others should be given at definite times to avoid upsetting the digestion, such as the alkalines, and particularly, the Bicarbonate of Soda. Nearly always, this is given at the moment of the meal, forgetting that digestion can only be carried on in an acid medium, so that it is upset and not benefited. The same thing applied to Belladonna which checks the glandular secretions, including those of the stomach.

Alkalines, most absorbing powders, and Belladonna should only be given at the moment, when the gastric pains, like those of hyperacidity, show themselves, i.e., to say, about two hours after meals, at the time when digestion is stopped and the pains appear from the fact of the renewed acidity.

The action of Quinine shows itself about seven hours after its ingestion, which is the guide for its administration in malaria. The same applies to Hypothermic drugs, which should be taken a certain time before the appearance of the rise of temperature, so as to check its rise, rather than to reduce it when it has risen and wearied the patient.

Purgatives should be taken fasting in the morning, with the precaution of not eating for an hour later and very sparingly. On the other hand, laxatives should be taken at night, two hours after the meal, so as to act in the morning.

An injection of Arsenobillon or Novarsenobillon should not be given after a meal. Breaking this rule has caused accidents.

Enemata should be given before and not after a meal.

Affections of the Eye due to Vitamin B deficiency*

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THE two groups B₁ and B₂ of vitamin B complex have important actions in preventing the various affections of the eye.

Vitamin B₁, thiamin, (aneurin or anti-neuritic vitamin) is the most important member of vitamin B complex. This vitamin is of fundamental importance for every single cell of the body. Regarding its requirements in normal conditions, several mgs. a day are sufficient for adults and children but in certain physiological and pathological conditions, such as exercise, pregnancy, lactation, fever and hyperthyroidism, etc., much larger quantities are required.

Owing to its deficiency, the most striking and constant symptoms arise from the degeneration of the nervous system. Hence affections of the eye relating to its nerves take place owing to its deficiency in the system.

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Ocular affections owing to its deficiency are :

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| 1. Dystrophy of conjunctiva and cornea. | } Mostly in association of the clinical picture of beri-beri and polyneuritis. (KRUSE and McCOLLUM, 1932. SCICLOUNOFF and BROCCARD, 1936. |
| 2. Retrobulbar neuritis. | |
| 3. Paresis of ocular muscles. | |
| 4. Supra-orbital and trigeminal neuralgia. | |
| 5. Facial paralysis. | |

The author had a case of acute retrobulbar neuritis which got cured by the intramuscular administration of vitamin B₁ (*Indian Journal of Ophthalmology*, Vol. 1). As no other specific cause could be assigned to it excepting a history of rheumatism and exposure to cold, two courses of Benerva Forte (Roche) was given. Vision in the right eye which went down to 6/18, returned to 6/6 (partial) with disappearance of the symptoms of tenderness on pressure upon the globe and the feeling of acute pain on its movements.

In addition to the abovenamed affections, the author has found cases showing low degrees of myopia and other abnormalities of the eye in a group of young and debilitated students who lived on the same diet with low vitamin B₁ content. The anorexia and faulty carbohydrate metabolism due to deficiency of vitamin B₁ in their diet caused malnutrition, as a result of which small degrees of myopia took place while they strained their eyes in their studies. On investigation, it was found that the vitamin B₁ intake of these young persons was probably slightly above the beri-beri-protective level. One of them also showed signs of degeneration of the brachial nerves. These cases seemed to recover or improve by the administration of vitamin B₁ and vitamin A in their diet and rest to the eyes.

Vitamin B₂ or G has been recently named 'Riboflavin,' which is a yellowish green water-soluble pigment occurring throughout the animal and the vegetable kingdom. At first the Flavins which were isolated from different sources were called by different names as 'Lactoflavin' derived from milk, 'Ovo-flavin' derived from egg, and so on. Subsequent works have, however, shown that they are all identical and the name 'Riboflavin' has now come into general use. Vitamin B₂ or G complex actually contains: (1) Riboflavin; (2) Nicotinic acid and its Amides—pellagra preventive factor; (3) Vitamin B₆; (4) Pantothenic acid; (5) Filtrate Factors (SWAMINATHAN, *I.M.G.*, Nov. 1942).

Ocular affections owing to deficiency of vitamin B₂ were said to be: (1) Alopecia of the lids; (2) Kerato-conjunctivitis with development of opacities; and (3) certain corneal degeneration (GOLDBERGER, WHEELER, LILLIE and ROGERS, 1926. DAY, LANGSTON, O'BRIEN and others, 1931); (4) Cataract (in some cases) (SEN 1935, AHMAD and B. C. GUHA); and (5) Optic neuritis (SHASTID 1929).

The daily requirements of Riboflavin for human consumption is probably 1.5 to 3 mg. The symptoms due to Riboflavin deficiency is known as 'ariboflavinosis' which was first described by SEBRELL and BUTLER in 1938 as a greasy dermatitis around the naso-labial folds and dermatitis in the neighbourhood of eyes and ears. Later KRUSES and others in 1940 showed that the specific type of glossitis (different from that seen in pellagra) and cheilosis, seborrhœic dermatitis and superficial keratitis may be seen in ariboflavinosis.

Riboflavin is found in a free state in the retina and vitreous and therefore probably concerned in some way with the mechanism of vision. The riboflavin in the retina when activated by light produces a photo-sensitive and active substance, the composition of which is not yet known. This substance is said to excite the activity of the optic nerve.

Recently AYKROYD and VERMA (AYKROYD and VERMA, *I.M.G.* 1942, VERMA, *I.M.G.* August 1942) have shown after investigations at the Govt. Eye Hospital, Madras, on patients having deficient vitamin B₂ content in their diet, that in their eyes the following affections are seen: (1) Superficial keratitis associated with stomatitis, fissured tongue and/or scaly dermatitis of the scrotum; (2) Squamous blepharitis with or without keratitis; and (3) Phlyctenular conjunctivitis (rare).

The corneal opacities in superficial keratitis consisted of dots or streaks in the superficial layers of the cornea, some of which stained faintly with flouriscin. In some cases, there were superficial corneal ulcers. According to these authors, the treatment which was carried on by the intramuscular injection of Lactoflavin (B.D.H.) with an initial dose of 2 mg. followed at daily intervals of injections of one or two mgs. (the total dose being from 5 to 24 mg. according to the severity of affection) caused diminution of pain and burning sensation within 24 to 48 hours and disappearance of all subjective eye symptoms as also objective signs of superficial keratitis and angular conjunctivitis within 3 to 12 days with the exception of some of the larger opacities which seemed to persist even after 12 days of treatment. MOORE has described cases of retrobulbar neuritis followed by partial optic atrophy. Signs of riboflavin deficiency was in association with the ophthalmoscopic picture. According to him treatment with Yeast and Marmite produced excellent results.

According to METIVIERO (in Trinidad) 'nutritional amblyopia' with temporal pallor of the optic disc has been seen. He thinks that these cases were due to vitamin B₂ deficiency as keratomalacia was rare in Trinidad. (VERMA, *I.M.G.*, Nov. 1942).

Acute Abdomen in Relation to Female Genital Organs*

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UNDER this heading I propose to describe cases of severe and diffuse abdominal pain, of sudden onset and rapidly increasing constitutional disturbances, giving rise to collapse. It would be easier to describe these conditions under three headings: I. In relation to pregnancy. II. In relation to infection. III. In relation to complications of tumours.

1. In relation to pregnancy.—Here acute abdomen is met under three conditions: (1) Rupture of uterus. (2) Concealed accidental hæmorrhage. (3) Extra uterine gestation.

1. Rupture of uterus may be conveniently studied under two headings: (1) Spontaneous rupture. (2) Traumatic rupture.

(1) Spontaneous rupture during pregnancy is rare, but may be seen in following conditions: (a) degeneration of uterine wall following previous pregnancy, or injury in previous confinement. (b) Cicatrix of a

*Specially contributed to 'The Antiseptic.'

previous Cæserian section giving way. Sometimes it assumes a very serious nature as rupture occurring during labour.

Spontaneous rupture during labour: Predisposing causes:—(a) contracted pelvis; (b) neglected transverse presentation; (c) hydrocephalus; (d) operation or manipulative interference to relieve a protracted and obstructed labour; (e) associated with all the various forms of protracted and obstructed labour. There is an element of bruising of the uterine tissue, the long continued pressure of the head against the brim of contracted pelvis, must lead to injury and weakening of the part of the uterus nipped between them and so predispose to rupture at that point; and (f) from pregnancy in a rudimentary horn of bicornate uterus.

(2) *Traumatic rupture:*—This occurs occasionally during pregnancy from a blow or fall. Most common cause is unskilful attempts at delivery. The mechanism of rupture is explained by excessive retraction of the upper with the corresponding thinning of the lower segment of uterus. When this thinning has reached a certain degree there comes a time when the slightest extra strain will lead to rupture. Further delay in delivery may cause the uterus to give way spontaneously.

Symptoms.—1. *Of impending rupture:*—These are of the greatest importance for if they are recognised and treated early rupture may be averted. The second stage of labour is protracted on account of some obstruction in spite of strong labour pains. The patient becomes restless and anxious, the pulse and temperature rising somewhat. The pains become more frequent and stronger and one pain tends to pass without interval into the next. There is acute pain and tenderness over abdomen. The retraction ring will be observed as an oblique ridge over the lower part of the abdomen, one or two inches above symphysis. As the condition becomes serious the ring will be observed to rise even higher.

2. *Of actual rupture:*—The above symptoms become more severe, and during the acute of a particular agonizing sharp and tearing pain. The patient cries out that something has given way inside her. This is followed by cessation of labour pains and a momentary relief is felt. Shortly after the rupture the patient presents symptoms of shock and collapse. The face becomes pale and drawn and forehead is covered with cold sweat. The pulse becomes thready in character and its rate is increasingly rapid. If the hæmorrhage is more severe than air hunger, disturbances of vision, and finally unconsciousness will follow. This sort of picture is seen in complete and big tear, the foetus lying free in the abdomen and large amount of internal hæmorrhage taking place and filling up the peritoneal cavity.

3. *Concealed accidental hæmorrhage:*—It is a rare condition. This may be defined as bleeding during the last three months of pregnancy owing to the premature separation of a normally situated placenta where blood remains in the uterus. It is commoner in multipara than in primipara, and bearing, decidual endometritis, interstitial and submucous fibroid, placental infarct and some diseases of the mother, e.g., nephritis, heart disease, anæmia, syphilis. It is of three types: (a) The blood may collect behind the placenta as a retro-placental clot; (b) the blood may separate the membranes from the wall of uterus but not as far as the internal os, and so remain lying between the membranes and the wall of uterus; and

(c) the blood may burst in the amniotic cavity. Muscle fibres of uterus are in poor condition of nourishment and so are incapable of contraction and retraction. The symptoms of this extremely serious condition are shock, collapse from internal hæmorrhage, as increasing pallor, faintness, restlessness, rapid feeble pulse, cold perspiration and air-hunger. There is increase in the size of the uterus which becomes hard and extremely tender to the touch, and patient suffers from acute agonising pains.

4. *Extra uterine gestation:*—Any condition which obstructs or delays the passage of the ovum to the uterus, but at the same time does not impede the passage of spermatozoa to reach the ovum. Causes which give rise to ectopic pregnancy: (a) excessive length and excessive tortuosity of the tube; (b) the occasional presence of blind diverticula; (c) previous salpingitis which partially destroys the mucous membrane and forms blind diverticula by fusions in mucous membranes and interference with the muscular contractility of the tube by sclerosis; (d) pelvic peritonitis by causing adhesions or kinking; (e) tumours of the tube; and (f) external irrigation of the ovum.

Tubal pregnancy is more often found in women over 30 than under it. There is often a history of several years secondary sterility. Here ectopic gestation in isthmic portion of the tube will be dealt with as this condition generally gives rise to intra-peritoneal rupture with profuse hæmorrhage. The failure to develop a decidua in the pregnant tube and the destructive action of trophoblast result in: (1) Muscular structures become unduly stretched out, and loosened; (2) large blood vessels may be eaten in; (3) placenta consists mainly of foetal villi which has no strong hold on the maternal tissue. These three results explain the three main dangers to which a tubal pregnancy is exposed, mainly rupture of the tube wall, hæmorrhage and separation of the embryo. This usually occurs after 6 weeks amenorrhœa.

Signs and symptoms.—Patient gives history of 6 weeks or 8 weeks amenorrhœa. She, without any warning, is seized with severe cutting pains in the lower abdomen, and occasionally a feeling as if something had given way. This is immediately followed by severe collapse, fainting, deadly pallor, with a small thready frequent pulse, severe pain and rigidity of abdomen. Death may happen without any rally, and before anything can be done. Some hours later if patient survives the presence of free blood in the pouch of Douglas can be made out as a doughy semi-solid mass (pelvic hæmatocoele). There is presence of dullness in flanks indicating the free blood in these regions. In the vast majority of cases the bleeding ceases when the patient passes into complete shock which is nature's provision for checking the hæmorrhage. If treatment is not carried out successfully the bleeding will recur, when patient vomits which is a prominent symptom at this stage, or any other such movement of exertion. Sometimes hæmatocoele formed as a result of bleeding in the act of tubal abortion, which is less serious than tubal rupture, may be infected from adjacent bowels and so gives rise to a very serious condition of pelvic peritonitis.

II. Infection.—Occasionally the facts of infection from genital tract will be most marked in certain of the tissues, such as pelvic peritoneum, Fallopian tube or the cellular tissue, but it will be obvious that no one structure is likely to be affected alone without some of the other

being implicated. If the infection has reached the pelvic peritoneum from the uterus there must also be the inflammation of cervix, body of the uterus, tubes and cellular tissue. Thus it commonly happens that a patient is seen with an acute inflammatory condition of the pelvis, in whom no exact diagnosis of the seat of the chief trouble can be given immediately. It is only after the lapse of some time, if ever, that it may be possible to state on which structure the force of the inflammatory process has fallen. This applies to the acute stage of the pelvic inflammation in which pelvic peritoneum is implicated. Here I propose describe this condition. Pelvic peritonitis is an inflammatory state of the peritoneum of the pelvis and is nearly of a bacterial origin.

Cause:—Primary focus may be from any of the pelvic viscera. These are: (a) septic endometritis after puerperal sepsis or septic abortion; (b) salpingitis; (c) appendicitis; (d) twisted and burst ovarian infected cyst; (e) infected hæmatocele; (f) perforation of uterus by a septic sound, abortion stick or any other instrument. If the acute pelvic inflammation follows after labour it is streptococcal or staphylococcal in origin.

If old condition flares up and there is no history of septic labour, then it is of gonococcal origin. In a large proportion of cases of pelvic inflammation, particularly the gonorrhœal cases, the infection extends by way of the uterine mucosa to the Fallopian tubes, and through tubes to the peritoneum and other pelvic structures. In puerperal cases the infection more often extends by way of the lymphatics, directly through the wall of the uterus from the endometrium to the connective tissues around the uterus and then to the peritoneum. Another avenue of entrance is through the thrombosed sinuses of puerperal uterus. Infection of the sinuses leads to thrombosis of broad ligament veins resulting in broad ligament abscess.

Changes:—Hyperæmia of peritoneum. It loses its glistening appearance and becomes red and slightly rough. Lymph and serum are poured out and this causes adjacent organs to become adherent. The remaining exudation collects chiefly in the pouch of Douglas. Such adhesions are protective in nature since by cutting off the general peritoneal cavity, they tend to limit the inflammation to the pelvis. Cases in which the inflammation is spreading too rapidly for adhesions to form, are much more fatal than the more common adhesive type. This exuded fluid may become absorbed or may become purulent. If the latter occurs the swelling becomes larger, and the mucosa of the vagina and rectum becomes œdematous and finally the abscess bursts usually into the rectum if left untreated.

In rare cases it may extend upward and cause general peritonitis, but adhesions which have roofed the pelvis prevent the general infection. If absorption takes place the mass gets smaller and consists of the thickened peritoneum and adherent lymph together with the adjacent viscera. Finally the inflammation disappears and the patient is left with adhesions of varying type. These adhesions contract and play an important factor in displacing the pelvic viscera. Thus uterus becomes retroverted and retroflexed. The intestines may be displaced downwards and bands may form to the omentum and other organs which subsequently cause strangulation of small intestines. The fibrated end of the Fallopian tube becomes sealed up by the plastic lymph and united firmly to the ovary.

the tube itself forming a pyo- or hydrosalpingo-oophritis. This thickened mass may be palpable behind the uterus long after the attack has subsided.

Symptoms.—The patient has frequently had a septic abortion, gonorrhœa, or appendicular colic. She is seized with acute pain in the lower abdomen, the pain is increased on movement, this is followed by distension together with flatulence and vomiting. The pulse rate is increased up to 120, temperature rises to 102°F. and rigors may occur. There will be rigidity of lower abdomen, tongue is dry and furred. If it is going to be of general peritonitis on account of acute infection and lowered resistance the condition becomes very serious. Pain which was localised before to the lower abdomen, becomes diffuse, and is associated with exquisite tenderness and great distension, the patient lies on her back with the knees drawn up to relax the abdominal muscles. The pulse becomes weak, rapid and compressible at this stage. The respiration becomes quick, shallow and thoracic in character. Vomiting is a prominent symptom, sometimes hiccough also appears. Absolute constipation is also present owing to the paralysis of bowels. As the case progresses, the patient's strength rapidly diminishes, the face becomes pinched and drawn. The extremities are cold, temperature which was rising at the onset falls down to subnormal, the death results from collapse and toxæmia.

III. *Complications of tumours in genital organs*:—(1) Torsion of the pedicle; (2) rupture of the cyst.

1. *Acute torsion of the pedicle* of ovarian cyst or pedunculated subperitoneal fibroid, may lead to very serious condition of acute abdomen. As a result of this twist the structures within the pedicle become compressed and the veins having thinner walls than the arteries supplying the tumour are more compressed than the arteries. Hence the tumours become engorged with the blood and finally strangulation results. Sometimes there may be severe bleeding into the cavity of cyst or under the peritoneum. In case of pedunculated subperitoneal fibroid are into the peritoneal cavity. In such serious cases the symptoms resemble those of acute peritonitis depending on the tightness of the twist. In this acute variety the mass becomes strangulated and infected from adjacent bowels, thus it eventually suppurates and general peritonitis sets in. Thus the mass which was felt of bigger size and tender gets obscured by effusion, rigidity and distension. All symptoms and signs of acute peritonitis appear.

2. *Rupture of cyst*:—Acute abdomen follows the rupture of a suppurating cyst. This rupture may take place during the act of forcible examination under anæsthesia, from extravasation of blood, due to acute torsion by thinness of the wall especially if it is degenerated or necrotic, by malignant papillomatous disease or by injury. The infected material escapes in the peritoneal cavity giving rise to peritonitis. It is very rare as usually there are so many adhesions on account of chronic inflammatory changes, so leakage is prevented. If anyhow the adhesions are not strong enough to prevent this the peritonitis will surely be set up and all the signs and symptoms of acute abdomen will appear, which are described well under the heading of infection.

Diagnosis of the condition giving rise to acute abdomen.—In case of rupture of uterus the diagnosis is quite obvious as the foetal parts can

be felt more easily than before, and patient is suffering from severe shock and collapse due to peritoneal irritation and internal hæmorrhage, the diagnosis is based on the toxic and debilitated look of the patient and on signs and symptoms of the present condition. In tubal rupture there is a typical history of amenorrhœa of a few weeks, after a period of secondary sterility when she has menstruated regularly. There is blood discharge from uterus, shedding of decidual casts, but there is no chronic villi if examined microscopically. Sometimes this sort of history is wanting, then the acute abdominal pain and faintness may be confused with the same signs which occur with a ruptured vessel on a tumour, a ruptured gastric ulcer, acute appendicitis, intestinal obstruction, renal or biliary colic, rupture or torsion of ovarian cyst and rupture of pyosalpinx. Mistaken diagnosis has occurred but it matters little, as the treatment is laparotomy and dealing with the cause in all these conditions. Difficulty in exact diagnosis of the condition arises because examination is difficult and general signs of acute abdominal disturbance may mask all localising signs. In a ruptured tubal gestation the rule is profuse intraperitoneal hæmorrhage noticed by the blanching appearance of the woman with dullness in flanks, indicating free blood in the peritoneal cavity. The temperature is low. The position where the pain has been first noticed is often helpful. The history of patient both as regards past illness and the onset of the present is quite important. Previous attacks of biliary colic and passage of stones may point out the origin from gall bladder. Past history of upset of stomach and vomiting of blood points out to ruptured gastric ulcer. In pelvic cases, generally, the rigidity and tenderness of lower abdomen, loss of respiratory movements below the umbilicus and sometimes the feeling of a pelvic swelling on bimanual examination will point to an origin from the genital tract. In appendicitis the pain is more likely to start as a general abdominal pain, the point of greatest tenderness and the inflammatory mass, if there is any, being felt in the appendix region instead of in the pelvic region. Vomiting is more persistent, the tongue more dirty and abdominal distension more marked. There is no history of abortion, labour, and upset in menstruation. On vaginal examination the resistance is unilateral on right side whereas in cases of salpingitis the physical signs are bilateral. In acute pelvic inflammation there is history of septic abortion, puerperal sepsis or old-standing gonococcal infection. There will be high fever with rigor. In acute abdomen following torsion of the pelvic tumour or rupture of it, there is a history of big mass in the abdomen arising in pelvis. In gonococcal salpingitis there is history of some pelvic disturbance and menstrual disorder.

Treatment.—In all these conditions giving rise to acute abdomen the best thing is to combat the shock, open the abdomen and deal with the cause. No time should be wasted in diagnosing the exact condition giving rise to the trouble.

Cases and Comments

An Interesting Case of Meningitis

MOHD. MOHSIN ALI ABBASI, M.B., B.S., P.C.M.S.,
Assistant Surgeon, Samrala, The Punjab.

ON the evening of 27th July, 1943, I was called in to see a Muslim boy, aged 15 years, who had suddenly become unconscious after having felt sick, giddy and vomiting a number of times. All this happened while he was enjoying a swing, 13 ft. high from the ground in his house.

Before the incident of this day he was in perfectly good health and partook his ordinary meals along with the other members of the family.

On examination he was found lying in his bed profusely perspiring, eyes closed and with a disinclination for all sorts of interference. His pulse was 60 per minute, and the temperature was 97.4°F. His liver was not enlarged, spleen was normal, chest was clear, heart was healthy and showed no abnormality. Other physical examination of the body was negative. During my examination he vomited once, a moderately viscid and partially digested food material.

Previous history.—He had not got about him the normal, bright good jovial look of a boy of his age. His father had passed away when he was in his mother's lap. The mother also had died when he was only 4 years old. His bring-up fell to the share of his maternal uncle. He has read only upto the 5th, and had to relinquish his studies on account of a gradual diminution of vision in both the eyes. He once got operated upon his left eye and has also got a lower iridectomy mark.

Treatment.—He was treated for syncope on the ordinary lines with a stimulant mixture, whereafter though he had retching he did not vomit. For drinking he was advised hot sips of tea with a decoction of cardamoms with anise fructus.

Next day on my visit I was told that he was bad at night, did not sleep at all, and that now he complained of persistent occipital headache. He was lying calm in the bed, opened his eyes and answered questions.

His examination revealed rigidity of neck with positive Kernig's sign. His pulse had further gone down to 54 per minute but he had no temperature. His bowels were costive, and had to be relieved.

My third day visit was more conclusive of meningitic symptoms. In addition to the positive Kernig's, he had now definitely developed head retraction, with a further slowing of pulse to 50 per minute and a sub-normal temperature.

He was advised lumbar puncture but it was refused. His bowels had moved twice since. He was now put on a sedative mixture.

On the fourth day of illness, he felt better, had a good sleep, headache had lessened and now was located to his frontal region, head retraction was less. He had a badly coated tongue, for which he was prescribed pill Calomel et Clolocynth at night, to be followed by a Saline purge next morning.

On the fifth day he offered me a bright pleasant look, no headache, had slept well at night.

Since then he made an uneventful recovery and was up and about on the eighth day.

This case presents the following points of interest:—(1) A sudden onset in an otherwise healthy boy; (2) No incidence of cerebrospinal fever in the *Itaga* before or after this case; (3) No history of exposure, nor any incidence of another case in the family; (4) Development of the typical symptoms of meningitis in a queer way; (5) A quick and uneventful recovery; (6) Post personal history of some interest.

The necessary permission to send these case notes for publication has been received from the Civil Surgeon, Ludhiana.

Acute Peritonitis due to Perforation of an Asymptomatic Latent Duodenal Ulcer

N. RAMA RAO, L.M.P.,

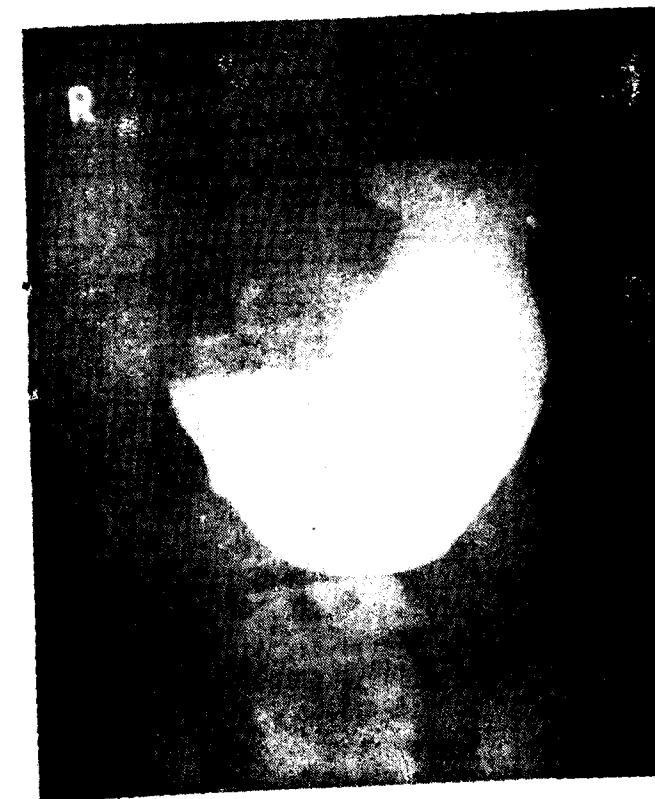
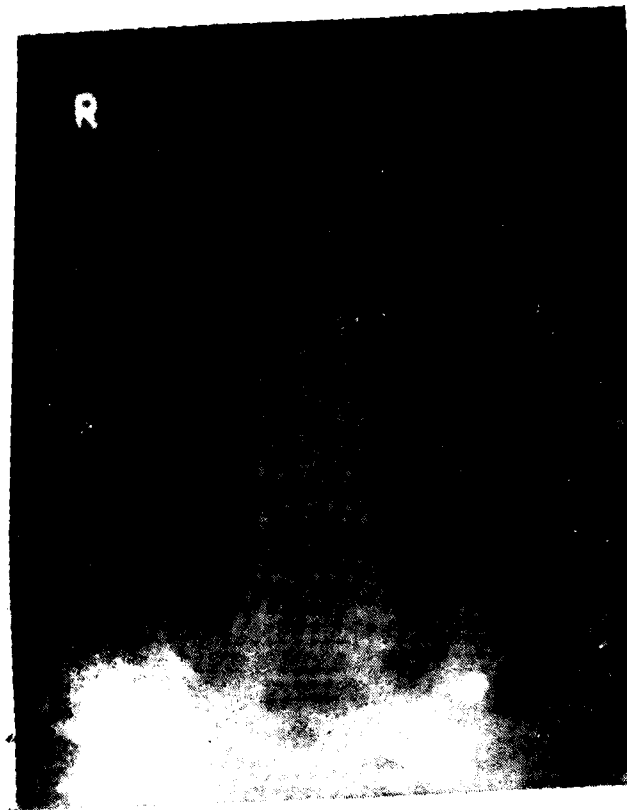
Subsidiary Rural Medical Practitioner, Gollapalli, Kistna Dt.

IN the year 1942 the writer was a victim to an attack of acute abdomen (peritonitis due to a perforated duodenal ulcer); and though the cause of perforation was uncertain at that time, subsequent investigation disclosed the existence of a duodenal ulcer on radiological examination. A detailed case report with the previous history is given below. In doing so the writer's only idea is, by placing his own case before the several experienced readers of this esteemed journal, to know the various views with particular reference to the possibility of any dangerous sequelæ affecting his future life.

Previous history.—The writer was generally having normal digestion. But occasionally he was subject to hyperacidity and used to vomit undigested food taken overnight in the early hours of the morning with burning acid fluid. These attacks, in his opinion, were synchronous with smoking, late, untimely and heavy dinners combined with late working during the night, as used to happen with the meetings of the District Medical Association and other medical associations' anniversary functions. But he never suffered from any kind of abdominal pain.

In the year 1941, he suffered for a period of 20 days from a vague abdominal discomfort in the upper part with distension daily coming on at about 4 or 5 p.m. and lasting till 9 or 10 p.m. The appetite was completely impaired and he did not relish any food. Some local doctor friends whom he happened to consult, detected an enlarged and tender gall bladder and expressed the probability of 'Acute Cholecystitis' and this necessitated a better and efficient consultation with one of the assistant surgeons in service who did not agree with their opinion but said the condition was only a flatulent dyspepsia with slight torpidity of liver. The writer finally improved with Mist. Hepatica combined with a course of Emetine injections. Ever since, Mistura Hepatica used to give him sufficient relief whenever he felt indisposed from indigestion and loss of appetite, combined with or without constipation.

History of the acute condition referred to.—On the morning of 20th July '42, there was the usual hyperacid vomiting with impairment of appetite. The following morning also the same thing recurred and he felt worse



ose Mist. Hepatica (without tr. of Mag. Sulph, anticipating moved 4 or 5 times without nage to attend to the routine al was not relished as there travel on his motor cycle to sional call and he returned discomfort not amounting to he felt as though his stomach and that he could only get he voluntarily vomited out a throat which at once tempo-relief merged into a sensation en with severe spasm of the pains became worse every was the only position fixed. and gave way to distension of orsal decubitus was impossible

f a grave import was touching whence medical consultation (l any major surgery was deci-out 20 or 30 miles off. The elieve the writer's suffering by lministering Pituitary extract ing that the distension was urpose. About the middle of eathing became much embar-inful and the writer fearing nly close the scene, took $\frac{1}{4}$ gr. y which magically warded off

owing day that a removal to a the trials were over and the a Government Hospital about n. on the 23rd July '42 i.e.,

ent of the case adopted are

sage of stools or urine. Pulse tis more marked on the right sine 10 c.c. given I. M. and e every 4 hrs. Laparotomy The patient was prepared for able at 4 p.m. Pulse again ussion between the surgeon peration was postponed and pplying Antiphlogistine over

p.m. in morning and 130 p.m. nd also Emetine 1 gr.

25-7-'42. Condition not worse. Both injections repeated, passed three bile-coloured stools and also urine in moderate quantity. Patient felt better after the movement of bowels.

26-7-'42. Distension slightly improved. Patient felt better and entertained hopes of gradual improvement. Both injections repeated. Pulse 106 p.m. Bowels moved thrice.

27-7-'42. Abdominal condition still better. Pulse 100 p.m. Bowels moved twice. Only Emetine 1 gr. given.

28-7-'42. Emetine repeated. Patient could turn on either side and could get himself relieved of the recumbent position which was being maintained all along.

The temperature was not a very marked feature except that on the day of admission it was 102.2°F. and during the subsequent 3 days it was ranging from 99°F. to 100°F. and on the 6th, 7th and 8th days it was up to 103.5, and, ever since, it was touching normal and going up to 100.5°F. even till the last two days of the date of discharge. The total stay in the hospital was 3 weeks and on 13-8-'42 he was discharged cured. The diagnosis held tentatively was peritonitis probably due to a small leakage from a latent duodenal or amœbic ulcer. After a lapse of 5 months, the writer, anxious to know his own case, got himself admitted under the care of an eminent surgeon in one of the hospitals in Madras in December '42 for investigation as to the cause of the disease. He also got himself examined by some of the well-experienced doctor friends of the locality. The results of investigation are the following:—

(1) Manual examination by the surgeon and other doctors revealed a perfectly normal abdomen. Only one doctor friend said that he could palpate matted intestines on the right side of abdomen a little above the umbilicus.

(2) F. T. M. revealed definite hyperacidity. (Copy of the report is given separately.)

(3) Cholecystography showed normal liver and gall bladder.

(4) The report of the radiologist after taking a series of skiagrams after giving barium meal runs thus:—"In 5 ms. ½ hour and 3 hours picture, there is a fleck of barium in the duodenal area. D. C. not visualised well. Rapid emptying of the stomach suggests peptic and duodenal ulcers—Gall-bladder visualised almost normally—No gall stones are visualised."

Copy of F. T. M. Report

GASTRIC JUICE.		Total acidity c.c. N/10 NaOH %	Free HCl c.c. N/10 NaOH %	Organic acids	Total chlorides	Mucus	Bile	Blood	Starch
Before Test Meal	...	19	3						
½ hour after	...	17	6						
1 "	...	31	22			Nil	Nil	++	Nil
1 "	...	44	35			Nil	---	---	++
1½ "	...	75	58			++	---	Nil	++
1½ "	...	71	51			++	---	---	++
1½ "	...	78	56			++	---	---	++
1½ "	...	57	37			++	---	---	++
2 "	...	45	35			++	---	---	++

The surgeon under whom the writer got admitted in Madras, after going through the whole case and the results of investigation, was of opinion that this was a case of duodenal ulcer and prescribed diet accordingly with an advice to be careful about the diet in future and to discard the motor bicycle.

The writer is to-day hale and healthy. But occasionally he suffers from loss of appetite, slight distension of the upper and sometimes of the lower abdomen, which may last for 3 or 4 days combined with constipation. Slight adjustment in diet gives him some relief. Otherwise he has normal digestion with good appetite. Even prior to this illness, never did he have any occasion to worry about his digestive system. But this being his own personal case about which he may have to be careful throughout his future life, especially with regard to any likelihood of a recurrence, which may God forbid, he is often confronted with the problem of correct diagnosis of the case. It is but evident from the history and the F.T.M. report that hyperchlorhydria was existing for a long time. But was a duodenal ulcer also existing simultaneously? If present, could it exist without giving rise to the typical pain at any time though it was burrowing through almost the entire thickness of the bowel wall as is evident from the fact it gave way with little exertion? or could it be that the signs and symptoms of the abdominal pain that came in 1941 were due to the duodenal ulcer only? Did the ulcer perforate? and, if so, do all the signs and symptoms described above go in favour of a sudden perforation and acute peritonitis? How many cases of peritonitis are so far on record that have come round without surgical intervention, even granting the peritonitis was set up by a small leakage? What would have been the prognosis of the case had the abdomen been opened up? The surgeon even now is of opinion that it would have surely ended in death. Supposing the perforation has been packed up with the Sulphanilamide treatment, what about the adhesions that must have been formed and their after effects? Could there not possibly be any other disease in which all the above symptoms and signs might have been produced? The writer has his own reasons to suspect the liver to be responsible for the disease either alone or in combination because Emetine relieved him of the suffering in 1941 and the same Emetine worked well in the acute peritonitis condition and also because the writer had suffered before from amœbic dysentery on more occasions than one and never happened to take a full course of Emetine treatment.

The following also may be of help in diagnosis:

(1) During the abdominal distension due to peritonitis, all through the writer was feeling a dragging pain of a severe nature over both the suprascapular regions (Trapizous muscles) and massage or pressure over them used to give some relief.

(2) By the end of the first week of his stay in Gudivada Hospital when he was able to turn on both sides, he used to feel, with every turn, a heavy noise in his abdomen comparable to the sound caused by the rolling of heavy coils of iron chains, as though they were placed in the abdomen.

(3) During the convalescence and for sometime after, any slight blow over the left lower chest gave a deeper transmitted pain into the upper abdominal viscera, besides the similar pain in the hepatic region existing for a long time before and even now.

(4) Ever since the acute illness, the writer dreads to take Mag. Sulph. or any other purgative. (Fortunately the bowels move regularly). It so happened during his stay in Madras hospital, that unknowingly he was administered Mist. Alba 1 oz. with a view to wash out the barium from the bowels. This dose caused irregular peristalsis of the bowels besides distension and much discomfort and pain in the abdomen though the bowels moved twice. Throughout the following 24 hours, and for sometime thereafter, he felt as though the transverse colon was full of wind which could not move either way owing to a spasmodic constriction at both flexures. On explaining the condition to the doctor in charge, a flatus tube was inserted and an injection of Pituitrin given without any relief and the suffering persisted for the following 10 or 12 days.

(5) When the bowels started to move from 25-7-'42, the writer felt the act of defecation and micturition an agony on account of the very severe burning of an unbearable nature of the rectum and urethra respectively. This suffering continued throughout his stay in the hospital and he was even demanding cocainisation of the rectum and urethra. The fæces were liquid and bilish.

(6) At first during the 1st 38 hours of onset of peritonitis, the distension was thought to be due to acute dilatation of stomach and the stomach was washed and oral Pituitrin given. Retained fæces were also thought to be a cause and a series of enemata were given to no purpose.

(7) The abdominal distension and discomfort that occurred in 1941 was preceded at first by headache and subsequently the urine became very high coloured and bilish. A local doctor friend who happened to examine the writer detected a tender gall bladder and liver and combined with a change in colour, consistency and quantity of the stools, he had to put the case as one of cholecystitis. The patient has definite reasons to believe that smoking in the day always aggravated his suffering in the night. The suffering was only due to a vague abdominal discomfort not amounting to any acute severe pain, but it never made him bed-ridden except for a day two. Three senior doctors whom the writer subsequently consulted, ruled out cholecystitis or cholelithiasis and said that it was a flatulent dyspepsia combined with a torpid or congested liver with the history of amœbiasis behind it.

(8) While the writer was a boy of 10 or 11 years he happened to swallow a small smooth marble stone of the size of a big soap nut. Subsequent searching of the fæces for the following 3 or 4 days did not show any expulsion of the stone.

The writer owes a life-long debt of gratitude to the Assistant Surgeon then in-charge of the Government Hospital, Gudivada, under whose care his life was saved and who so kindly attended upon him; his thanks are also due to the then District Medical Officer, Kistna, who came and examined him more than once; and to the Superintendent of the Madras Hospital under whom the investigation of his case was so carefully done; and to all the professional brethren whom he consulted prior to, during, and after the acute illness, for their valuable advice and opinion and also to those doctor friends who were eagerly and anxiously enquiring about his health during the illness and even personally looked to his comforts during his stay in the hospital.

The writer, while giving out his own above case report in such a

detailed manner, also wishes to express the fate and helplessness of a rural practitioner serving as he is in a remote and out of the way place when such a grave and acute illness befalls him with little or no chances for immediate medical aid or even transport.

The writer, in his own interest, craves the indulgence of the learned and experienced readers of this journal for bestowing their thought and giving their valuable views and opinions as to the cause and nature of the disease and whether and how it is likely to affect his future health. For this he would only be too glad to give them any further information that may be required.

Parenteral Use of Quinine Hydrochlor Sulph in place of Q. Bihydrochlor in Malarial Fevers

M. M. ADHIKARY,

Resident Medical Officer, Lohagarh, T. E., Darjeeling (Terai).

IN these critical days where Quinine Salts have been scarcely available, specially Q. Bihydrochlor, my colleagues may try Quinine Hydrochlor Sulphate in all types of malarial fevers by intramuscular route. The salt in my hand and in my criterion has given best result in contrast to Q. Bihydrochlor. In hyperpyrexial type of M.T. infection where 30 grs. of Quinine Bihydrochlor is required to combat the fever, only 20 grains Q.H.S. has been required in a majority of my cases. The bye-effects, such as, giddiness, faintness, hypotonia, muscular weakness which have been noted after oral administration of this salt in my series, there was none after intramuscular injection. There was giddiness in one case in an anæmic hill girl, who stood up just after the injection. I think this was temporary anæmia of the brain which caused it. Besides, there was no local reaction either during or after the injection. Even the subject cannot feel any pain should the injection be given very slowly. I am illustrating four of my series for the perusal of my fellow brethren.

1. A hill women, aged 32, was suffering from hyper-pyrexia. The temperature remained stationary (105°F.) for six hours. Slides were taken for M. P. and there heavy infection of *P. Falciparum* was noted, every field showed four to five parasites, mostly marginal. She was injected 10 grs. of Q.H.S. with the result that the temperature began to decline within an hour of the injection and became normal on the following morning. The injection was repeated and there was no further recrudescence.

2. Mrs. D., second para, bearing six months' pregnancy, contracted malignant malaria of hyperpyrexial type. Temperature rose upto 106.4°F., sponging could not keep the temperature down below 105°F. Presently, 10 grs. of Q.H.S. was injected by intragluteal route, preceded by a single dose of Peacock's Bromide. There was no untoward effect upon the uterus. In this case too the temperature began to drop in the same manner and remained 102°F. on the next morning. Injection was repeated. The same temperature maintained throughout the day and finally disappeared on the following morning. No Q. salts were given as a control case on that day and there was no further rise of temperature. Q.S.

from the next day in $2\frac{1}{2}$ grs. doses t.d.s. was given for the next couple of days. Here too blood slides examined but scanty parasites were seen. I think there was more sporulation in the internal organs.

3. Another hill girl of tender age complained of having fever on every fourth morning. Slides were examined in this case; 2 quatern rings, few merozoites and four mycrogammetes were found. She was given one injection of Q.H.S. She had her rise of temperature on that day. No injection on the intermediary days. Again one injection before two hours on the day of getting the paroxysm. There was no rise. I am sorry I could not drive the gammetes as I had no agent.

Fourth case is an adult male, victim to B.T., received the treatment on the same line as of Q.T. He recovered. I have treated small series of cases and no B.W.F. has fallen in that category. I use the under-noted formulæ:—

Q. Sulph	...	grs. 10.
Acid Hydrochlor Dil	...	1 c.c.
Aqua Sterile add	...	5 c.c.

In all cases filtered water was used and diluted Hydrochloric acid was made locally. The strength of 6 oz. to a pint (*vide* O'MEARA's *Medical Guide*, 3rd edition).

My thanks are due to the D. B. BELGACHI, T. E., who kindly gave me formulæ and suggested to try the drug.

I also owe by gratitude to Mr. R. M. GUHA, Manager of this Estate, who kindly permitted to report these notes and who took pains in persuading coolies who refused injection treatment of Q.H.S.

Breath-holding Spells

Their relationship to syncope, convulsions, and other phenomena:— (Bridge, Livingstone and Tritze: J. Paed. 1943, 23).—Two groups of children were studied. One group consisted of 188 children, drawn from a well-known baby clinic, and the other of 83 children brought to a children's hospital over a period of years, specifically because of the breath-holding spells in its severer forms. These spells are of frequent occurrence in the first year of life, usually beginning before the middle of the second year and ending on the average at about three and a half years. In most children, the attacks are mild and are outgrown as crying becomes a less common mode of expression. In some, however, the episodes are associated with cyanosis, unconsciousness, convulsion and may require medical care. Frustration and anger are the usual precipitating circumstances, pain and fever being less common causes. Disturbances of behaviour resulting from poor habit-training and parental attitudes, form a background in most instances. In addition to these external factors a sensitized respiratory apparatus and vasomotor instability contribute to the condition. The general outlook for children with breath-holding spells is good, although in a few cases, epilepsy developed later. The treatment consists in placing the child in a horizontal position, to prevent its falling, as soon as the breath-holding can be recognised. As the phase of recovery becomes evident he may be safely left to take care of himself. The patient should be encouraged to display an attitude of purposeful neglect. Most important from the standpoint of prevention is an attitude of quiet, confident firmness whenever questions of behaviour arise—G. P.

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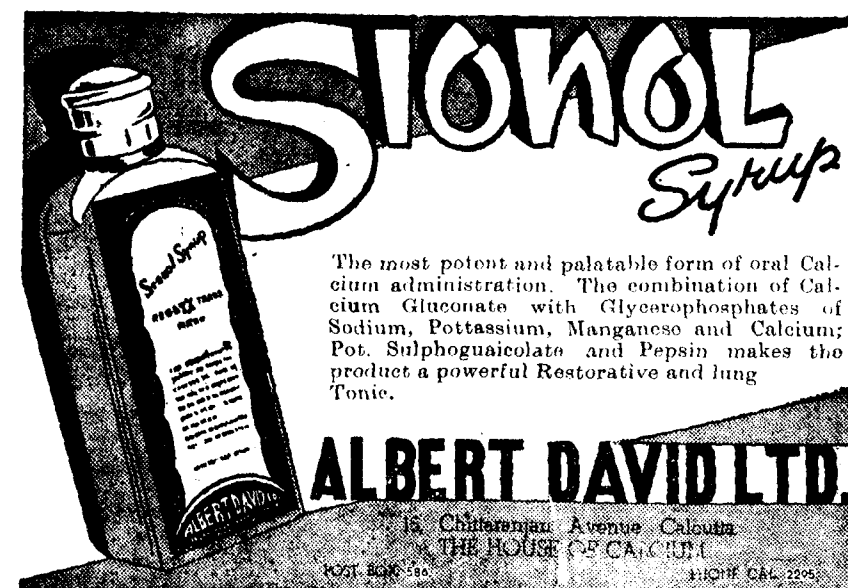
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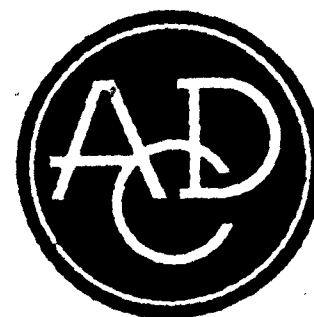
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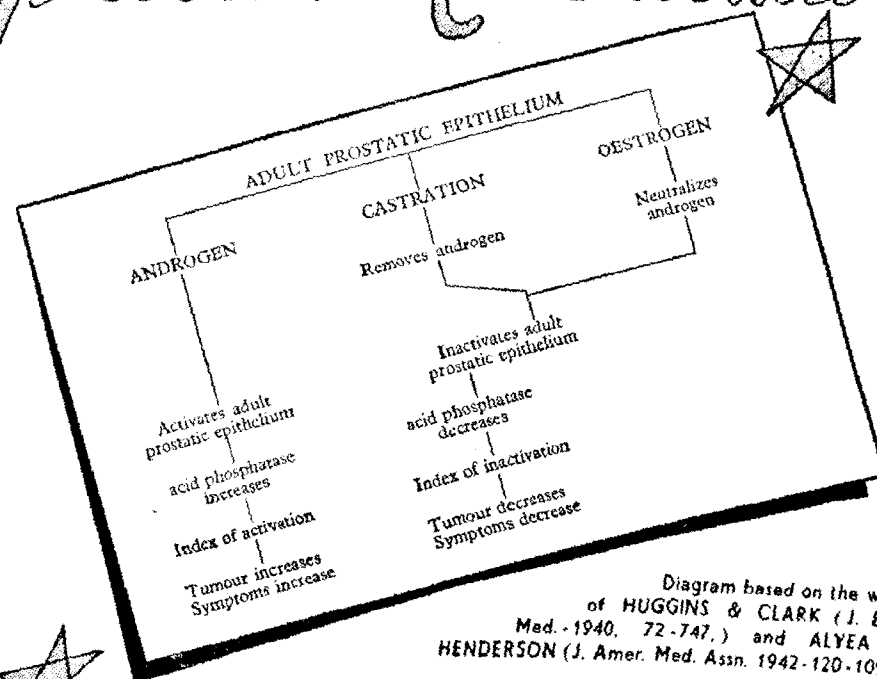
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Health of the City of Madras

THE year 1943 was exceptionally a bad one for public health so far as the city of Madras was concerned. There were 30,366 deaths in the city with a mortality rate of 37.59 per mille. This compares very unfavourably with the death rate of 22.67 per mille in 1942. Of these, 12,984 deaths occurred among infants and children under 5 years of age, and 6,106 among persons of 60 years and above. Of the 12,984 deaths, under the former head, 7,295 were of children under one year. This gives the infantile mortality rate of 247.3 per 1,000 live births as against 196.76 in the preceding year.

Of the total deaths, 7,857 were from respiratory diseases alone, compared with 4,093 in the previous year. There were 400 deaths due to cholera and 3,520 to diarrhoea and dysentery, 398 to tuberculosis and 116 to typhoid. This increase, on the surface, shows a very unsatisfactory state of affairs. But taking into consideration the abnormal conditions that prevailed in the year 1943, one need not be too worried about these figures. People who had migrated from the city in the previous year owing to the war scare returned back in large numbers. In addition, a large number of people from all parts of the province flocked to the city to seek employment as a result of the tremendous increase in industrial activities due to war. Although the estimated population of the city based upon '41 census was 8,07,873, this figure is far below the real population. It is presumed that the population in the city at present has exceeded the million mark. This tremendous influx of people naturally resulted in inadequate housing and insufficient food-supply. Owing to the scarcity and non-availability of building materials, new houses could not be built and the existing ones were found absolutely insufficient to accommodate this enormously increased population. Added to this, there was difficulty in getting sufficient quantity of wholesome foods, like milk, vegetables, ghee and other necessities of life. They were either not available, or were so costly as to be beyond the reach of the ordinary man. On the top of these difficulties, the city had the misfortune to have unprecedented floods in October '43. For nearly a week several areas remained under water, and water-supply and electric current to a greater part of the city were cut.

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off for a few days. Conservancy and sanitation were of necessity at a stand-still, and it was really gratifying that the situation which, at one time, seemed to threaten the health of the city and land us in a great catastrophe quietly passed off. To the health staff and to the various public institutions and to the other voluntary organisations of Madras which did yeoman service in those days, the city owes a great deal.

As mentioned above, among the principal causes of death, respiratory diseases, diarrhoea, dysentery, cholera, and enteric fever played a major part. There were two epidemics of cholera, one in the first quarter and the other in the last quarter of the year. From a perusal of the report we find that 6 lakhs of people were inoculated against cholera, which was evidently a record for the city, and, compared with the mortality in other parts of the Province, the total deaths under cholera must be regarded as low.

Tuberculosis claimed 398 victims. There is no doubt that this disease is spreading in the city. It may be that this large number is due, to a certain extent, to the deaths in the Tuberculosis Hospital in the city. But apart from that, there is no doubt that the number of the tuberculous continues to increase. It would be worth while if notification of pulmonary tuberculosis was made compulsory and insisted upon. We are quite sure that the total number of persons suffering from T.B. very much exceeds the figure mentioned in the report. Many of these find it difficult to get admission in the government hospitals in the city. The present accommodation for tubercular cases is absolutely insufficient for a large and growing city like Madras and the effort of the Mayor and the Health Officer to open tubercular clinics for the present, and, later constructing a hospital, is, indeed, a very laudable one. Most of the patients that are now in government hospitals are drafted from the mofussil and the poor patients of the city find no admission into any of these hospitals and are left to linger in the city and act as foci of infection and spread the disease. We would strongly urge on the Corporation to open these tubercular clinics at an early date.

Typhoid fever is said to have claimed 116 victims. But we are quite sure that among the 2,345 deaths from other fevers, there were a large number of typhoid cases also, though 658 is the number given as having suffered from typhoid in the city during the year. The treatment of typhoid fever is also not very satisfactory in the city. The treatment of have a fever hospital, in which all such serious cases should be admitted and properly nursed. At the present moment, a few beds are reserved in the wards of the Government General Hospital. But this is quite inadequate. The Corporation and the Government should, in the very near future, build a fever hospital for treating such cases.

Diarrhoea and dysentery accounted for 3,521 deaths, compared with 2,251 in the preceding year. Small-pox claimed 13 deaths out of the 65 attacks. This improvement in the situation, so far as small-pox is concerned, is due to preventive measures taken during the year, when 1,26,983 vaccinations were performed as against 89,190 in 1942. Malaria claimed 67 deaths, but there is no doubt that it is on the increase. With the difficulty now felt in getting sufficient supplies of quinine, malaria control has really become a difficult problem. Much anti-mosquito work has been done in 1943. There was heavy rain-fall during the year,

as a result of which sub-soil water rose high and extensive stagnation occurred everywhere and the drains got silted up. These formed ideal grounds for mosquito-breeding. But, anti-mosquito measures were evidently carried out with sufficient vigour. The tanks and ponds which are present in large numbers in the city should be constantly inspected. At present, in addition to the normal tanks existing, we have a large number of tanks in the city built by the A.R.P. for the purpose of storing water. These, in most cases, have been found to be potential grounds for the breeding of mosquitoes. We hope the Corporation and the Government will pay special attention to these tanks and see that they do not become breeding places for mosquitoes. Reclamation of low-lying lands should also be undertaken on an extensive scale to prevent stagnation of water. This will help in the prevention of mosquito-breeding.

In the field of medical relief, the Corporation maintained 23 outpatient dispensaries, two leprosy skin clinics and one venereal clinic and one infectious diseases hospital. The newly started leprosy and skin clinics and the venereal clinic are doing very good work. The former have been able to discover early cases of leprosy in the city and have treated them successfully. During the year there was an enormous increase in the incidence of scabies. Its prevalence was widespread so that there was not a house in the city where scabies was not present in one member or the other in the family. The infectious diseases hospital has also done good work.

Medical inspection of Corporation Schools has been continued. It has been reported that there has been a deterioration in the nutritional condition of the children, and the percentage of ill-nourished children rose from 24.29 to 26.52 in the case of boys and from 1.70 to 6.46 in the case of girls. It is gratifying to note that minor ailments are treated in the various Corporation dispensaries while the more serious cases are referred to Government hospitals. It was found out, as a result of these inspections, that 356 children suffered from leprosy in early and non-infectious stages and these were followed up and treated. We are glad that re-inspection and follow-up work are done. We have always held that these are very important. Unless re-inspection is done and follow-up is made mere pointing out of the defects will not help mend matters.

Food control has shown a decided improvement. As a result of the persistent agitation against the insanitary condition of the markets in the city, the Corporation tightened up the rules and insisted on the owners to carry out improvements and repairs to the various markets. The public analyst gives a report of 2,060 samples of foods, like milk, butter, ghee, oil, coffee, etc., as having being analysed.

"Conservancy has been bad," says Mr. J. P. L. Shenoy, the Commissioner. This is mainly due to the transport difficulties caused by shortage of bullocks, carts and lorries and also due to strict rationing of petrol. The number of private flush-out latrines and Public Conveniences is also inadequate. Here again the non-availability of materials may be the cause, but the fact remains that the condition could have been improved.

The condition of cattle yards in the city must receive particular attention at the hands of the authorities. Some of the cattle yards do not satisfy sanitary requirements and are not well maintained.

A word about the working of the Maternity and Child Welfare Scheme would not be out of place here. It is indeed gratifying to note that 11,227 out of the total of 29,498 births, came under the care of the Scheme. Out of these, there were only 27 cases of maternal mortality. We are glad to note that pre-natal clinics where health visitors give advice to expectant mothers are being continued. Special attention must be paid to this aspect as it is essential that pre-natal care and pre-natal examination should be given great importance in the scheme of Maternity and Child Welfare.

It is true that 1943 was an exceptional year, and that many factors contributed to this state of affairs. But, taking into consideration the difficult conditions under which the health staff had to work, it could safely be said that the Health Officer and his team did good work against odds. But there are certain improvements which we should like the authorities to make.

First of all, as everybody knows, there is in Madras the river Cooum which is kept in a very bad state and it must be improved at a very early date. We hope the Corporation and the Government will attend to it without delay.

The second important point that must be tackled is the beggar problem. Beggars in our city come under many groups. There are the able-bodied beggars, there are the diseased beggars and there are the professional aged beggars. The diseased beggars are a source of nuisance and they are to be found at all crowded places, exhibiting their disease to earn the sympathy of the citizens. The able-bodied beggars and the diseased beggars must be removed from the field, and the only way to do it is to start homes for these two sets of people. The Commissioner has started a fund for the purpose of tackling this problem. We hope the response from the citizens and others will be really encouraging and will enable him to carry through his scheme. After that legislation will have to be undertaken to house and segregate such beggars. It may now be contended that without the provision of a home, it may not be possible to legislate. The Commissioner's action and the response made by the public thereto will surely prevent any such plea being put forward.

Slum improvement is another reform which must be undertaken as early as possible. As the Health Officer rightly points out, underground drainage to all the slums and butting grounds in the city is a very urgent necessity. The Health Officer correctly emphasises the fact that where the owners are too poor to bear the cost of the work, suitable concessions should be shown as it will ultimately benefit the city. In the matter of slum improvement every effort must be made by all concerned. Employees of large labour like the Railways, Port Trust, Mills &c., must be compelled to construct suitable tenements for their workmen. We hope the Health Officer will have a better report to give next year.

Gleanings From Medical Press

MEDICINE and THERAPEUTICS

The Administration of Alkalis in Sulphadiazine Therapy.—With a view to preventing renal complications in surgical patients in whom it was necessary to administer sulphadiazine, a method of rapidly producing alkaline urine has been used at the Evanston Hospital, Illinois, the results of which are recorded by J. H. Rohr and F. Christopher (*Surgery, Gynecology and Obstetrics*, May 1944, 78, 515). After the determination of the pH of 422 specimens of urine taken from twenty patients post-operatively, beginning twenty-four hours before alkaline therapy and continuing for five days thereafter, it was found that an average of twenty-two hours was required to establish alkalinity. Using a one-sixth molar sodium r-lactate solution, each of seven patients was given 1,000 c.cm. intravenously on the first post-operative day. In most cases the urine was alkaline by the time the intravenous administration was finished, and in all cases three hours afterwards; the urine remained alkaline for an average period of twenty-four hours. Two patients received the solution for two days, one for three and one for four days. The general principle was that the solution was administered until the patient was able to take sodium bicarbonate orally, in dosage of 3 to 30 gm. daily; 24 gm. in four divided doses was found to be the smallest amount that would keep the urine consistently alkaline. As sodium sulphadiazine precipitates with one-sixth molar sodium r-lactate when mixed in the flask or intravenous tubing, the method adopted was to add 500 c.cm. normal saline to the intravenous set when the one-sixth molar sodium r-lactate had been given, and after 200 c.cm. normal saline had been administered the sodium sulphadiazine was added to the remaining 300 c.cm. of saline solution: ampoules containing 10 c.cm. of 25 per cent. sodium sulphadiazine were employed. In cases in which additional glucose and fluids were required, 5 or 10 per cent. dextrose in lactate-Ringer's solution was given, and when intravenous administration of fluids for several days was anticipated, 1,000 c.cm. amigen (Mead Johnson & Co.) was administered intravenously to supply protein. In cases in which the urine was rendered alkaline by the described method there was no incidence of renal complications following the administration of sulphadiazine. In one case, in which the patient did not receive the sodium r-lactate post-operatively and in which sulphathiazole was placed in the abdomen at operation, oliguria, abdominal pain with haematuria and heavy sulphathiazole crystalluria occurred two days after operation; these symptoms disappeared promptly after the administration of 1000 c.cm. of the sodium r-lactate solution and 30 gm. sodium bicarbonate orally for two days.—*Practitioner*.

treatment of urticaria is: (a) to inject subcutaneously 5 minims of adrenaline chloride solution (1:1000) and if the case is a severe one to repeat the injection of another 3 minims $\frac{1}{2}$, 1, 2, 4 and 8 hours later as there will be a tendency for the symptoms to reappear when the temporary effect of the adrenaline has worn off. The adrenaline action may be sustained by injecting slow adrenaline ($\frac{1}{2}$ to 1 c.cm. of adrenaline (1:500) in an oil, gelatin, or glycerin base); (b) to give ephedrine hydrochloride $\frac{1}{2}$ gr. 4 hourly until the rash is clear for 48 hours, and luminal $\frac{1}{2}$ gr. night and morning to lessen the itching; (c) to relieve local irritation by warm alkaline baths, dusting the skin with an orris root free talcum powder containing $\frac{1}{2}$ % menthol, or employing a calamine lotion or cream containing menthol 1% and phenol 1%; (d) to clear the gastro intestinal tract by giving an emetic early, or saline aperients, castor oil, or calomel later; (e) to reduce the food intake, forbid alcohol, and force fluids.

To prevent recurrences the cause should be determined, and a careful history, the use of skin tests, and the employment of eliminating measures in the environment and diet are essential. Certain substances may cause urticaria in any individual—the injection of certain drugs, the eating of decomposed foods, the bites and stings of certain insects and jelly fish.

Intractable urticaria is usually an allergic manifestation in an allergic subject. The allergic causes include: (a) inhaled substances; (b) ingested substances, ordinary foods or common drugs; (c) ingested substances, such as an overdose of allergen following serums, blood transfusions, the bites and stings of insects, or following injected drugs, vaccines, endocrine substances or gland extracts; (d) infected substances from bacteria, intestinal parasites or mycotic infections; (e) concomitant substances—the touch or lick of various animals, or the use of their products in clothing or furnishings, the handling of certain foods, or plants, the use of cosmetics, dyed clothes or even adhesive plaster; (f) physical agents such as light, heat, cold and trauma.

In chronic cases the first thing to do is to stop all previous medication, as drugs play such a large part in its causation. Inhalant factors are the next commonest cause, especially when cases are worse in bed, during the night, or on waking. During the day house and occupational dusts play an important part, and desensitization is necessary. Foods are the least commonest specific cause, but most patients suffer from flatulent indigestion, and 20 minims of ac. hydrochlor dil in a wine-glassful of water at the beginning of each meal is helpful. The raising of the basal metabolism by adequate doses of thyroid extract is often necessary. If the cause cannot be determined or removed the withdrawal of 10 c.cm. of blood

Cause and treatment of urticaria.—The

from the vein at the elbow and its injection intramuscularly into the buttock on six occasions at intervals of 5 days is usually more efficacious than other methods of treatment recommended.

Urticarial outbursts often follow emotional storms, anger or fright, in states of fatigue, or after exertion. Such incidents utilize any available protective adrenaline and so render the sufferer more susceptible to some offending allergen acting during this adrenaline depletion or exhaustion state.—*B.M.J.*

The emergency narcotic treatment of mental cases.—Paraldehyde is an excellent hypnotic agent for patients with alcoholic confusional psychosis or with uncomplicated delirium tremens and is also helpful when given in small doses of brandy to certain restless patients liable to collapse. In patients with status epilepticus or certain mental diseases paraldehyde may be administered per rectum in 360 minim doses repeated if necessary. Oral administration of paraldehyde is not recommended for patients with bronchitis or pneumonia and the drug is contra-indicated in acute nephritis. Usual dose is 60-120 minims but up to 360 minims paraldehyde may safely be given and in acute excitement 120-180 minims b.i.d. or t.i.d. For psychosis of moderate severity and for acute anxiety or hysteria, a mixt. of 10 gr. chloral hydrate, 15 gr. potassium bromide, and water to ½ ounce is commonly used. Small doses of chloral may also be given periodically to patients with epileptic insanity in the control of extreme excitement. When marked pain is present 5 minims morphine tartrate or ½ gr. morphine sulfate may be given. For patients with chronic mania or with noisy forms of dementia, sulfonal is valuable and keeps such patients quiet for longer periods than any other comparable drug.—*Practitioner.*

Treatment of Barbiturate Poisoning.—The clinical course of an acute case of barbiturate poisoning is potentially dangerous, the danger being that either the cardiac or respiratory center, or both, may be so depressed as to bring about cardiac or respiratory collapse. The usual immediate cause of death is respiratory failure.

In mild cases, withdrawal of the drug relieves the symptoms. With severe intoxications, with coma or with impending coma, active and often heroic treatment is required.

The principles of treatment are:

- (1) Removal of the drug from the gastrointestinal tract;
- (2) Counteraction of the depressing effect of the drug on the central nervous system;
- (3) Prevention and treatment of circulatory collapse and its secondary complications.

Active treatment is as follows:

- (1) Insure a patent airway.
- (2) Put the patient in shock position in bed, with the head lowered.
- (3) Gastric lavage: This is done routinely even if the patient has been in coma for hours. With nausea there is pyloric spasm and a resulting delay in emptying of the gastric contents. Gastric lavage should be done by inserting a large-sized stomach tube through the nose. There should be three separate washings of the stomach, using 1 quart of warm water for each. After the removal of the residual of the last washing, 2 ounces of magnesium sulfate, or 4 ounces of a 50 per cent. solution are instilled into the stomach.

Specific treatment consists of giving picrotoxin intravenously. The most convenient way to give this medication is to set up a continuous intravenous drip. There are two reasons for this: first, it is the most effective method of giving the picrotoxin, and, second, it supplies fluids and thus hastens the excretion of the barbiturate through the kidneys. With a continuous intravenous drip apparatus in use, the picrotoxin solution is injected by a hypodermic syringe into the rubber tubing 6 inches from the intravenous needle. Thus the patient need have but one needle introduced into his vein although he requires numerous and repeated intravenous injections of the picrotoxin. The amount of picrotoxin to be given is directly dependent upon the depth of the coma.

The usual commercial solution of this drug (Picrotoxin-Abbott) contains 3 mg. per cubic centimeter. Usually the picrotoxin is given intravenously at the rate of 1 cc. or 3 mg. per minute until the effects of this stimulus begin to show in the form of tremors of the extremities, twitching of the lips and eyelids and movement of the eyes. The patient will not recover consciousness at this time. As soon as the stage of twitchings has been reached, the dose is decreased in frequency so that the patient is kept at the level of the minimal twitching, for at this level the respiratory and cardiac centers are receiving the maximum stimulating effect of the drug. The respirations become deeper and more rapid and the pulse slower and stronger. Usually it is necessary to give about 1 cc. every 5 minutes to keep a patient at this level. As time progresses and the effects of the barbiturate wear off because of metabolism and excretion of the drug, the dose of picrotoxin is slowly diminished in frequency, being given every 10 minutes and then every 15 minutes. It is discontinued entirely when the patient is sufficiently restless to move about in bed in response to minimal external stimuli.

If an overdose of picrotoxin is given there is a possibility of the development of a clonic or tonic convulsion. While this is rather alarming to the doctor and nurse, it is not serious and can be immediately counteracted by the administration of from 2 to

5 cc. of sodium phenobarbital or other soluble barbiturate intravenously.—*DORSEY, J. F.: Picrotoxin treatment of barbiturate poisoning. J. Nerv. & Ment. Dis. 92: 367-375, April 1944.—U.S.N.M.B.*

Patent Ductus Arteriosus.—According to Shapiro it is no longer sufficient to make a broad diagnosis of congenital heart disease, since with the present diagnostic aids it is generally possible to identify the lesion more exactly. This is particularly true of simple uncomplicated patency of the ductus arteriosus. Two types of patency of the ductus occur. Failure of closure may accompany a developmental defect of the heart and the open ductus may be the only possible escape for the abnormal circulation. In such instances the flow of blood usually continues as in the fetal circulation; that is, blood flows from the pulmonary artery to the aorta, thereby resulting in cyanosis. The other type of patency occurs as a simple failure of closure and is accompanied by no other cardiac abnormalities. It is this type of case which lends itself to surgical ligation. The author lists the following diagnostic criteria of patent ductus arteriosus: (1) history of heart disease from birth or early childhood; (2) no cyanosis or clubbing of the fingers; (3) stunting of growth in a small percentage of cases; (4) probable thrill over the pulmonary area; (5) characteristic machinery murmur; (6) increased pulse pressure; (7) enlargement of pulmonary artery and branches; (8) normal electrocardiograph; (9) probable enlarged heart. The great majority of patients with patent ductus arteriosus develop some cardiac difficulty in early adulthood. It is quite rare to examine a patient with patent ductus arteriosus over the age of 40. When the diagnosis of uncomplicated patent ductus can be made, surgery should be seriously considered, particularly in patients showing evidence of cardiac strain. In Minneapolis 19 patients with patent ductus arteriosus have been referred for surgical treatment. These patients ranged in age from 3 to 19 years. The ligation has been successfully carried out in 16 instances. Two patients died of hemorrhage. One child developed a blood stream infection about two months after operation, from which she subsequently died. The clinical results in the successful cases have been satisfying.—*J.A.M.A.*

Liver Stores and Ketosis.—The glycogen content of the liver depends upon input and output balance, and upon nervous and endocrine controlling factors. It is undoubted that sympathetic activity associated with emotional excitement, or exertion may cause a temporary decrease in the glycogen stores. If, however, adequate food intake is maintained it is improbable that the sympathetic activity could be sufficiently prolonged to maintain a state of glycogen depletion. The effect of emotion, excitement or exertion on the complex interrelationships between insulin and the pituitary and adrenal cortical hormones is not known.

The generally accepted view of ketosis is that the major source of ketonic bodies is fat. If the proportion of carbohydrate to fat being burnt is lowered, there appears to be difficulty in the combustion of acetoacetic acid. The accumulating acetoacetic acid is detoxicated by reductases to form beta-hydroxy-butyric acid and by decarboxylases to form acetone.

Imbalance between carbohydrate and fat may occur due to exogenous factors, such as a high fat diet or to endogenous causes such as depletion of carbohydrate stores in starvation, lack of insulin with consequent interference with carbohydrate oxidation or to excessive mobilization of fat as by ketogenic hormones. Ketones may also arise from other sources than fat, such as the non-nitrogenous residue of aromatic amino-acids. In ordinary cases of ketosis found in clinical practice, however, it is probable that an upset of fat and carbohydrate metabolism is the main underlying cause.—*B.M.J.*

Therapy in Congestive Heart Failure.—Digitalis and its glycosides restore the normal output by depressing conduction from the auricle to the ventricle and so reducing the number of impulses which reach the ventricle. The ventricular rate is slowed, and the ventricle has time to fill. Digitalis, however, has another action: it increases the force of contraction of the cardiac muscle. When this action is demonstrated on a normal heart muscle it is small and not impressive; in muscle which is damaged, however, it is much greater.

Strophanthin is used for patients with heart weakness and normal rhythm. It is given intravenously and has a similar action to digitalis, but it is not cumulative, so that the injection can be repeated every other day. Fränkel used 1.240 grain (or 0.25 mg.). One of his more remarkable charts showed the loss of 15 lb. oedema fluid in a patient to whom he gave strophanthin, despite the existence of arteriosclerosis, a heart rate of 40 per minute, and complete heart-block.

There are many patients who after an attack of pneumonia or bronchitis continue to suffer from congestion at the base of the lungs for some time. A careful trial of digitalis in the form of leaf or tincture, or as the crystalline glycoside digoxin, should certainly lead to more rapid disappearance of the congestion.

Observations also have been made on the effect of theophylline diethanellamine on the cardiac output and of coramine and metrazol or cardiazol. None of these substances affected the cardiac output of patients with congestive heart failure, and the only substance which produced any effect at all was theophylline, which in a dose of 0.2 g. given intravenously caused a slight increase in the oxygen consumption. It is excellent to have clinical evidence from patients with heart failure that these substances do not

act as cardiac stimulants.—Editorial. *Digitalis* in congestive heart failure. *Brit. M. J.* 1: 429, March 25, 1944.—*U.S.Na.M.B.*

Sulfonamides and Hepatic Damage.—It is now generally agreed that the sulfonamides on rare occasions may provoke clinical evidence of hepatic damage. This refers particularly to the occurrence of a toxic hepatitis with jaundice. However, when careful liver function studies have been employed in studying this problem it has been revealed that liver dysfunction was not uncommonly induced by sulfonamide therapy. Watson and Spiuk in a study of 110 patients receiving sulfanilamide observed that the usual therapeutic doses of sulfanilamide were often associated with some evidence of dysfunction of the liver such as urobilinogenuria, elevation of the serum bilirubin or outspoken jaundice. In fact, 16 patients were observed to have jaundice as a result of therapy with sulfanilamide. This incidence is higher than usually recorded and may be due to the individual cases selected for treatment. It is of some interest that a lower incidence of jaundice was noted among patients receiving sulfapyridine. Similar observations were made by Kapnick, Stewart and Lyons, who found a decrease in plasma prothrombin as one of the earliest signs of impending hepatic failure resulting from sulfonamide therapy.

While sulfonamide therapy may cause hepatic dysfunction or less frequently severe damage to the liver, this should not deter any physician from administering sulfonamides when there are clearcut indications for their use. It is believed that sulfadiazine and sulfamerazine are less toxic for the liver than sulfanilamide. There is some evidence that one must be particularly cautious before initiating treatment with a sulfonamide when severe hepatic insufficiency is already present. Even in such cases sulfonamide therapy is warranted when an infection amenable to such treatment is present. This leads up to the question of inaugurating sulfonamide therapy in a patient with an obstructive type of jaundice due to a stone in the common bile duct. Such patients often have hepatic dysfunction and morphologic changes in the parenchyma of the liver. A cholangitis is not uncommon. Sulfonamides, administered orally or parenterally, are excreted into the bile. On the other hand, such treatment is often accompanied by disappointing results. The nature of the infection precludes successful therapeutic results because of the presence of pus, detritus and dead microorganisms which inhibit the action of the compounds. Not infrequently *Escherichia coli* is the predominating species of bacteria present, and some strains are notoriously resistant to the anti-bacterial action of the sulfonamides. In conclusion, a physician may face the problem of administering a drug that may accentuate hepatic dysfunction and in most instances fail to effect the clinical course of the disease, namely infec-

tion associated with cholelithiasis.—*J.A.M.A.*

Toxic reactions to the Intravenous Injection of Mercurial Diuretics. The authors report two fatal reactions to the intravenous administration of mercurpurin, with post-mortem observations in each. They also describe various nonfatal reactions to this drug and classify them into the immediate and the delayed types. The study of the mechanism of the reactions leads to the conclusion that the fatal and the immediate non fatal reactions probably result from a direct toxic effect of mercury on the heart, whereas the delayed non-fatal reactions are incidental to the diuretic action of the drug. These conclusions seem to be substantiated by experimental work on animals, as reported in the literature, and by the author's own clinical observations. At present there is no known way of preventing fatal reactions. Since mercurial diuretic drugs are valuable therapeutic agents in the treatment of congestive heart failure, and since the frequency of severe or fatal reactions to their administration is low, the usefulness of these drugs outweighs their possible danger. They should, however, be administered only when clearly indicated, and the occurrence of danger signals, which have been discussed, warrants a complete re-evaluation of the therapeutic regimen in any given case. It is well to remember that, at the present time, no fatalities have been reported after intramuscular injection of a mercurial diuretic, and that the diuretic response often compares favorably with that which results from intravenous injection. (Wexler, J. and Ellis, L.B., *American Heart Journal* 27: 86, January, 1944).—*U.S.O.W.J.*

Symptoms of Effort Syndrome.—While the symptoms are variable, they consist chiefly of rapid heart action, breathlessness, dizziness, fatigue, and pain in the region of the left breast. The physical signs are fairly characteristic, and the most constant are these:

(1) The general expression usually denotes fatigue, the facial expression being tired and expressionless. In some cases the general demeanour suggests apprehension; (2) the cardiovascular system is normal, by both clinical and laboratory standards, except that tachycardia of effort is excessive. At rest the pulse rate is usually increased when the patient is examined by the doctor, but it is apt to be normal when recorded by the nurse or during sleep; (3) the hands are bluish, cold, moist and usually tremulous; (4) sweat often pours from the axillae during the examination; (5) frequent sighing is common.—GORDON, K.: Effort syndrome. *Canad. M. A. J.* 50: 362-363, April 1944.—*U.S.Na.M.B.*

Tonic action of Strychnine.—Strychnine is often used as the principal constituent of tonic mixtures. This custom is in part

dependent on the belief that in therapeutic doses this drug has a beneficial action on the gastro-intestinal tract, promoting the appetite, rendering the digestive processes more efficient, and thereby increasing weight and general well-being. Strychnine in virtue of its taste has the action associated with simple bitters which reflexly increases the appetite and the flow of gastric juice. Therefore, in order to determine whether strychnine has any effects other than those due to the taste the drug should be given parenterally.

From these investigations three positive findings emerge: this drug appears, first, to stimulate the fasting stomach to active contractions; secondly, in some cases to hasten the emptying-time after a test meal; and, thirdly, to increase the volume and acidity of the fasting gastric juice. No evidence has been here adduced to indicate that the parenteral administration of strychnine leads to any improvement in the general condition of the patient.—ANDERSON, W. F.: Tonic action of strychnine. *Brit. M. J.* 1: 360, March 11, 1944.—*U.S.Na.M.B.*

SURGERY

Calculus of the Prostate.—Prostatic Calcification occurs in three forms: (1) multiple small round (seed) calculi, (2) large intraprostatic stones, commonly faceted when multiple, and (3) massive calcification (tuberculous). Urinary calculi lodged in the prostatic urethra or in a communicating pocket or pouch of it should not be included. These have been called "false prostatic calculi" by some but the term is confusing.

The origin of true stones in the prostate may vary. Some probably arise from precipitation of the salts found in normal prostatic fluid, calcium and magnesium phosphates; Kretschmer found a predominance of calcium oxalate. Corpora amylacea, the "starchy bodies" present in almost every adult prostate, have been held as the probable nucleus of some. Calcification of almost the whole gland has been reported and usually attributed to a pre-existent tuberculosis.

Diagnosis.—Of 77 cases reviewed by Kretschmer, 24 occurred in the fifth decade. There was no patient under 20, and 56 were men between 40 and 70 years of age. Many prostatic stones cause no symptoms and are discovered accidentally. The findings of multiple seed calculi between the inner hyperplasia and the outer compressed prostatic layer is common at the time of prostatectomy, particularly by perineum. There may be an associated prostatitis and the presence of stones produces no symptoms. Once infection occurs in the presence of stones, its relief by the usual methods is almost impossible. Abscess caused by stones is very rare. Other prostatic stones produce local disturbances. Urinary symptoms predominate (frequency and dysuria), sexual symptoms are occasionally present, and rectal symptoms only rarely. Localized and referred pain is common. Pain in the perineum may develop from sitting on hard surfaces. In some cases, prostatic stones have been passed in the urine.

A routine examination reveals prostatic calculi presumptively by palpation (rectal) and positively by x-ray examination. Rectal examination often gives the first suspicion through circumscribed hardness or occasionally crepitation. The sclerosis of chronic prostatitis, the induration of carcinoma, or the nodulation of tuberculosis may occasion difficulty in differentiation. It is

a common experience to miss the presumptive diagnosis of stones completely in rectal palpation.

X-ray examination commonly shows shadows (1) as a scattered mottling, a midline grouping, or a bilateral conglomeration of seed calculi, (2) as a sharply defined shadow of solitary stone or faceted stone, and (3) as a massive calcification.

Treatment of prostatic calculi depends upon individual indications. In the silent cases, no direct treatment is required. In the group producing symptoms, removal may be indicated and is best performed by perineal prostatectomy. In instances of badly infected prostates with multiple stones in older men or of massive calcification, total prostatectomy and bilateral seminal vesiculectomy may be required. Chronic prostatosperminal vesiculitis may fail to respond to ordinary methods of treatment because of stones.—*Bull. N.E. Med. Centre.*

Traumatic Arterial Spasm.—In arterial spasm following fracture, early operation is required. Repeated manipulations during the first 48 hours should be avoided. Tourniquet spasm and allied conditions following crushing injury differ from arterial spasm, and for such conditions nerve block and icing of the limb till circulation is restored, are advocated. In management of the anæmic limb, it is not enough to elevate the limb on pillows; the splint must be deliberately suspended. Cooling rather than icing is indicated. For the first 72 hours ice bags should be suspended over the limb to keep it cool. The limb should not be completely enclosed in ice, for that will interfere with fibrin formation and the whole process of repair; icing of the skin edges of the amputation stump will prevent the edges gluing together. Cold does not induce arterial spasm in the deeper vessels in patients subjected to amputation during refrigeration.—*Lancet.*

Gelatin as a Plasma Substitute.—Koop and his associates report on the use of 4 per cent. and 6 per cent. solutions of gelatin administered to 100 patients. Altogether there were 190 infusions totaling 132 liters of gelatin solution. There were no untoward reactions attributable to the gelatin with the exception of one man who had previously reacted unfavorably to infusions

of blood, plasma, glucose, saline solutions, and amino acids. The administration of gelatin produced a favorable response after major operative procedures similar to that observed with plasma transfusions. Nine patients given repeated infusions of gelatin at intervals of at least 14 days did not exhibit anaphylaxis. No increase in clotting time was observed in 7 patients after gelatin infusion. No bromsulphalein retention was observed after single or repeated infusions in 17 patients. The authors found no evidence of any permanent change in renal function as determined by urea clearance even in patients with pre-existing renal damage. Following the infusion of gelatin there is a depression of the serum protein concentration which cannot be accounted for by hemodilution as measured by hematocrit. The decrease involves the albumin, globulin and fibrin fractions. There is a reciprocal relation between the concentration of the serum proteins and the circulating gelatin, the latter disappearing from the blood stream in three to five days. Elevation of venous pressure was constantly observed. There was no apparent relationship between the rise in venous pressure and the volume or rate of infusion.

The cardiac output as measured by ballistocardiograph was constantly increased after infusions of 750 to 1,000 cc. of a 6 per cent. gelatin solution. The increase reached the maximum 3 to 4 hours after infusion and returned to normal within 24 hours. In acute experimental hemorrhages in voluntary human subjects, the replacement of two-thirds of the volume of blood removed with a 6 per cent gelatin solution corrected changes in blood pressure, venous pressure, pulse stroke, volume and cardiac output secondary to blood loss. Those authors believe that gelatin solutions are effective in the treatment of at least the early phases of hemorrhagic shock. Histological examination of the tissue of 8 patients who died of their respective diseases at intervals varying from 3 hours to 6 weeks after receiving gelatin revealed no evidence of gelatin storage in the tissues or of irreversible tissue change.—(U. S. O. H. I.)

Meningoencephalitis in Lymphogranuloma Venereum.—Zarafonitis presents evidence that lymphogranuloma venereum may be a cause of acute meningoencephalitis. He reports 2 cases. A virus was isolated from an inguinal lymph node of 1 patient five months after the onset of illness, in spite of the fact that the histopathologic changes in the lymph node were nonspecific. The virus was identified as lymphogranuloma venereum. Mice were immunized to this virus and to another strain of lymphogranuloma venereum by intraperitoneal injection. Subarachnoid block, an extremely high total protein and first zone colloidal gold curves were observed. Positive Frei tests were obtained on 1 patient with an antigen made from the virus isolated from him as well as with other yolk sac antigens. An intradermal test on the same patient with psittacosis antigen was negative. The

etiologic relationship of the virus to the meningoencephalitic changes was based on the involvement of the central nervous system, the knowledge that this virus can produce meningoencephalitic signs in experimental animals, the fact that the virus has been isolated from the spinal fluid of other patients with the disease and the negative serologic results in tests against other encephalitis-producing virus agents. Final proof that lymphogranuloma venereum can cause meningoencephalitis in man must await isolation of the virus from the brain substance in a fatal case and the demonstration of microscopic changes in the brain tissue consistent with those produced by the virus in experimental animals. On the basis of the spinal fluid dynamics, the first patient presented a complete spinal block throughout the eight months he was observed. It is believed that the meningeal involvement early in the course of his illness resulted in subarachnoid block. This syndrome is known to occur in patients with acute purulent meningitis, tuberculous meningitis, yeast meningitis and syphilitic meningitis. Since these causes were excluded by cultural and serologic studies, it appears probable that the adhesive arachnoiditis was a residuum of the lymphogranuloma venereum infection.—J. A. M. A.

Treatment of Traumatic Peritonitis.—According to Hejduk, internal bleeding and shock are the commonest causes of death in abdominal injuries during the first twenty-four hours. Peritonitis is a later danger and follows a rupture of a hollow viscus or infection of the effused blood. The purulent contents of the abdominal cavity are removed either by dry wiping or by irrigation. Opinions about the effectiveness of these methods are divided. Hejduk worked for nine years under a chief surgeon who was a partisan of radical irrigation and for seven years at a university clinic where only the drying method was employed. The drying of the abdominal cavity is simple, quick and efficient. Some employ this procedure in all cases of peritonitis, even in traumatic ones. The advantage of the drying method is that the infective material is not diluted and spread all over the peritoneum. Therefore even some partisans of irrigation prefer to perform drying in the early stages. In war surgery it has the advantage that it does not require special equipment and is therefore practicable even under primitive circumstances. The author thinks that in serious progressive cases of peritonitis or in cases with highly virulent infection, irrigation gives better results than the drying method. Also the intra-abdominal postoperative abscesses and fibrous intraperitoneal adhesions are less common after under pressure, provided it is done with from 30 to 50 liters of saline solution, as employed by Bakes of Czechoslovakia, is the best method to remove quickly and gently of viscera, gastric or intestinal contents, urine, particles of missiles or clothing found

within the peritoneal cavity. Perforations of the intestine can easily be discovered during irrigation when the irrigating fluid becomes turbid. It is hoped that the average mortality of 8 per cent. achieved by

Bakes with irrigation under pressure will in the future be lowered even more by the combined use of lavage and the administration of sulfonamide compounds or penicillin.—J. A. M. A.

OPHTHALMOLOGY

Recent advances in clinical ophthalmology.—Keyes, J. L. Ohio State Med. Jour., 1943, v. 39, Dec., p. 1110.

Indications, effectiveness, dosages, and contra-indications to the use of the sulfonamides and penicillin in ophthalmologic conditions are discussed.

Thygeson's summary of the use of the sulfonamides in the viruses of trachoma, inclusion conjunctivitis, and lymphogranuloma, and in ocular infections due to gonococcus, meningococcus, alpha and beta hemolytic streptococcus, staphylococcus, pneumococcus, influenza bacillus, diplobacillus, coliform rods, Friedlander's bacillus, and pyocyaneus bacillus is quoted.

Sulfadiazine is the drug of choice for internal medication. Local application of 5 per cent. sulfathiazole or sulfadiazine in an ointment composed of 100 per cent. hydrous wool fat is most effective, although a base of 25 per cent. hydrous wool fat and 75 per cent. petrolatum is nearly as efficient. Local drops of 3 to 5 per cent. sodium sulfathiazole (water-soluble) is useful, although occasionally irritating after prolonged use because of the alkaline pH. Adequate dosage of any of the sulfonamides, used orally, and adequate duration of therapy are stressed because of the risk of developing a sulfafast strain of infecting organisms, or of the danger of a relapse.

Optimum blood-sulfadiazine levels lie between 7 and 13 mg. per 100 c.c. In adult males of army age this is best assured by an initial dose of 4 gm. and subsequent dosage of 1 gm. every four hours for the first 24 hour period. Once the level is established it can usually be maintained by 1 gm. every five or six hours. Alkalinization is maintained by roughly corresponding doses of sodium bicarbonate. Sodium citrate is substituted the third day if the urine is alkaline to litmus paper.

Penicillin so far is effective locally and systematically in infections caused by streptococcus hemolyticus, staphylococcus aureus, pneumococcus, gonococcus, meningococcus, B. diphtheriae, and Koch-Weeks bacillus. Further analogy between penicillin and the sulfonamides is noted in that organisms may become fast to either drug, and also that bacteriostatic rather than bacteriocidal action is characteristic of each.

The activity of penicillin is greatly reduced in the presence of colon bacilli. Instillation and parenteral use of penicillin are effective. Concentrations of penicillin up to 5,000 units per c.c. are tolerated in eye instillations. Instillation every half to one hour is advised for acute phases, with gradual diminution until several days after clinical cure. Intravenous and intramuscular dosages of penicillin range from 5,000 to 15,000 units administered every two or

three hours, with a total maximum dosage of 120,000 units in 24 hours.

Hospitalization for treatment with penicillin is advised, because of the scarcity of the drug and its rapid tendency to deteriorate. Owen C. Dickson.—A. J. Oph.

Indications for Paracentesis of the Anterior Chamber.—Peter C. Kronfeld, J. Indiana, M. A. 37: 113, 1944.

Paracentesis oculi benefits some forms and phases of uveitis and keratitis but is valueless or definitely contra-indicated in many other ophthalmologic conditions. Usually puncture is done to remove undesirable material from the anterior chamber, to reduce intraocular pressure, or to remove the blood-aqueous barrier. Few hemorrhages into the anterior chamber need surgical removal and recurrent bleeding never demands such procedure.

Paracentesis is considered essential by Peter C. Kronfeld, M.D., of Chicago, when absorption of hyphemas is slow or impossible because the iris is trophic, is covered by a homogenous membrane or is entirely absent. Operative intervention is also indicated when intraocular pressure remains elevated after severe contusion to the eyeball. All foreign bodies should be removed from the anterior chamber except chemically inert substances, such as droplets of petrolatum or cotton fibers which may be carried into the chamber during injury or operation.

Most paracenteses are done to lower abnormal intraocular pressure. This procedure is indicated in cases of progressive ulcerative keratitis and, after conservative measures have failed, for patients with glaucoma secondary to uveitis, excepting cases of iris bombe. In glaucoma secondary to uveitis paracentesis will produce a relative hypotony of from two to five days. Since a second or even a third paracentesis may be necessary, the first should be done with a narrow keratome. Paracenteses either with or without suction are equally successful. Suction aids in removing blockage from the angle but it is doubtful whether removal of inflammatory proteins actually reduces the pressure.

In cases of progressive ulcerative keratitis paracentesis brings about a state of hypotony that encourages healing of the ulcers. To be beneficial, the hypotony must be maintained until bacterial activity has been inhibited. Daily paracentesis may be repeated for periods up to three weeks by introducing a spatula between the lips of the wound if the original keratotomy has been made at right angles to the corneal surfaces. Fistulation through such an

incision, and hyperemia with rapid reformation of fluid may be beneficial.

In some phases of chronic anterior uveitis paracentesis is indicated for removal of the barrier rather than for the effect on intra-ocular pressure. In cases of chronic iridocyclitis without ciliary injection, one or two paracenteses should be performed if other measures are unsuccessful.

Many ophthalmologic conditions are not

benefited by paracentesis, particularly cases of glaucoma due to a narrow angle, including iridomal attacks, acute congestive glaucoma and some forms of chronic congestive and non-congestive glaucoma. Eyeball puncture not only has no therapeutic value in the acute dramatic phase of narrow angle glaucoma but may aggravate the condition and is contra-indicated even as a temporizing measure. (E.N.T.)

Book Reviews

The Essentials of Modern Surgery.—Edited by R. M. HANDFIELD-JONES, M.C., M.S., F.R.C.S., and A. E. POIRITT, M.A., M.Ch., F.R.C.S., with the help of 15 contributors. Second edition.—624 illustrations, many in colour. E. & S. Livingstone, Edinburgh. (1943).

The book before us is the second edition of the well-known *Modern Textbook of Surgery*. The war has rendered inevitable many changes in those sections dealing with wounds, burns, hemorrhage and shock. These have been largely re-written and brought up-to-date. Sections on Inflammation and Infection, Cleft Palate, Thyroid Surgery and Hernia have been re-written and re-arranged. The subject on Fractures has been revised, and the chapter on Deformities and Low-back pain has been re-arranged. In a book that is uniformly well-written, it is very difficult to pick out any chapter for special mention. The Chapters on Injuries of the Chest, Hernia, Surgery of the Abdomen, Deformities, and that on Kidney, however, require special mention. The printing and the general get-up together with illustrations are of a very high standard. We recommend the book as an excellent text-book on Modern Surgery.

The Queen Charlotte's Text-book of Obstetrics.—By the members of the Clinical Staff of the Hospital: Sixth edition, 4 coloured plates, and 290 text figures. London, J. & A. Churchill Ltd., (1943).

This book sets forth the views held and the methods practised by the members of the staff of Queen Charlotte's Maternity Hospital. It follows the usual arrangement of text-books of Obstetrics and gives in a clear and concise manner the various diseases and their treatment. There is a section on "The Baby" which is useful and contains many practical hints. It deals with the healthy baby, then with the premature baby, and then with the sick baby. A chapter is devoted to the various drugs in midwifery and also a brief description about anaesthesia in Obstetrics. The chapter on Maternal Mortality and post-natal care also contains much useful information. This is a good book on Obstetrics.

Minor Surgery.—Edited by SIR HUMPHRY ROLLESTON, Bt., G.C.V.O., K.C.B., M.D.,

F.R.C.P., and ALAN MONCRIEFF, M.D., F.R.C.P., with an introduction by SIR ALFRED WEBB-JOHNSON, K.C.V.O., C.B.E., D.S.O., F.D., published on behalf of *The Practitioner*, by Eyre and Spottiswoode (Publishers) Ltd., 11, 15 and 16, Bedford Street, London, W.C.2 (1943). [16 sh. net.]

This is a compilation of the monthly series on "Minor Surgery" appearing in *The Practitioner*. It has been brought up in a book-form. The various articles deal with conditions which usually fall within the province of the general practitioner and it will surely prove a useful guide for him. It will also be useful for the hospital resident and for those who want to embark on a surgical career, for as it is correctly mentioned by Sir Alfred Webb-Johnson, in the introduction "the acquirement of dexterity and skill in minor proceedings is the first step to the development of a good operator." Subjects dealt with are varied and the authors of the various articles are authorities in their respective fields. We are sure the general practitioner will find, in the pages of this book, much that is of essential value in his everyday work.

Pathological Histology.—By ROBERTSON F. OGILVIE, M.D., F.R.C.P. (Edin); 235 photomicrographs in colour—Second edition: Edinburgh, E. & S. Livingstone (1943).

This volume was originally designed to act as a companion to a standard text-book of Pathology and to meet the need of the student in the class of morbid histology and to the graduate seeking more specialised knowledge in pathological processes. Its text is based on a series of lectures in pathological histology delivered at Edinburgh University. Earlier chapters deal with the phenomena of degeneration, vascular disturbances, inflammation, repair and tumours, while the later chapters are devoted to special diseases of the various systems. Each microscopical description is introduced by a macroscopical account of the diseased tissue or organ and, in some cases, brief space is also given to the etiology of the condition. A feature of the book is the illustration of its text by 220 photomicrographs in colour. The second edition which is before us has been completely revised. Recent advances in the sphere of pathological processes have been incorporated. It is a very useful book for Pathological Histology.

A Pocket Surgery.—By P. H. MITCHNER, C.B.E., T.D., M.D., M.S. (Lond.), F.R.C.S. (Eng.), D.Ch. Hon. (Durham), D.L., and A. HEDLEY WHYTE, D.S.O., M.B., M.S. (Durham), F.R.C.S. (Eng. and Edin.); J. & A. Churchill Ltd., 104, Gloucester Place, London, (1943).

This is really a concise *reademum* embodying the essentials of the various surgical injuries and diseases. Commencing with a section on the principles of war surgery, the various systems with their injuries and diseases have been regularly dealt with, and it gives a very brief resume of most of the important surgical facts. It will be a very useful text-book for those who are in need of a ready and brief reference.

Chest Examination.—By RICHARD R. TRAIL, M.C., M.A., M.D. (Aberd.), F.R.C.P. (Lond.), with a Foreword by SIR WALTER L. LANGDON-BROWN, M.A., M.D., F.R.C.P., D.Sc., LL.D., with 47 illustrations. (1943). J. & A. Churchill Ltd., 106 pp.

This book is an attempt at correlation of physical and X-ray findings in diseases of the lung. This enables the student or the practitioner to build up a mental picture of what exactly is happening in the chest. The first section of the book gives salient points of normal anatomy and physiology which explain the abnormalities of the commoner chest diseases. The 2nd section is on Applied Pathology. In this, the main gross and microscopical changes induced by these diseases are considered. Section 3 sums up the physical findings in the diseases discussed in Section 2. In all these 3 sections, an attempt is made to correlate physical signs with X-ray findings. The last section deals with the abnormal film. In this section the interpretation of abnormal shadows in X-ray photographs are discussed. The book is very useful and will help in the better understanding of the diseases of the chest.

Psychological Medicine: A short introduction to Psychiatry.—By DESMOND CURRAN, M.B., F.R.C.P., D.P.M., and ERIC GUTTMANN, M.D., L.R.C.P., ED. FOREWORD by J. J. CONYBEARE, D.M. (OXON), F.R.C.P. (1943). Edinburgh: E. & S. Livingstone. 188 pp.

War has done much to bring psychiatry into the limelight. The stress of war both in the services and on the home-front has brought to the surface great numbers of psychiatric patients, who in days of peace would have managed to struggle along unaided and undetected. Practically every disease, whatever systems of the body it affects, may have a psychiatric aspect. Great numbers of patients whose illness is primarily a mental one, display symptoms

referred to the various organs, and are usually treated by the doctor rather than the psychiatrist. It is therefore necessary for every practitioner, whether within or outside the services to familiarise himself with the more practical aspects of psychiatry. This book serves this purpose very well. It stresses the practical aspect of mental diseases. It is written in a very practical and lucid manner. A separate chapter has been devoted to the study of War-time Psychiatry, which will be very useful to Medical Officers in the various services. It is a book which will be valuable both to the student and to the practitioner.

Diseases of Infancy and Childhood.—By WILFRIED SHELDON, M.D., F.R.C.P., with a foreword by the late Sir FREDERIC STILL, K.C.V.O., M.A., M.D., LL.D., F.R.C.P., Fourth edition, with 133 Text-figures and 14 plates. London: J. & A. Churchill, Ltd., (1943) 748 pp.

This well-known text book of Diseases of Infancy and Childhood continues to maintain the same excellence as the previous editions. The progress in the department of diseases of children has been rapid during the past few years. This book keeps us abreast of recent developments. The chapters on prematurity and diseases of the newborn have been revised. The subject of undescended testicle, has been discussed. New treatments include benzyl benzoate in scabies infection, Atebrin in lamblasis. A number of useful prescriptions have been included. The printing and get-up are excellent. We are of opinion that it is an excellent text-book on Diseases of Infancy and Childhood which every practitioner must possess in his library however small it may be.

An Atlas of the Commoner Skin Diseases.—By HENRY C. G. SEMON, M.A., D.M. (Oxon.), F.R.C.P. (Lond.), 2nd edition (Reprinted 1943), Bristol: John Wright & Sons, Ltd., 271 pp.

This atlas portrays in natural colour, some of the common dermatoses frequently seen in the routine of out-patient practice. With each plate is also given abbreviated clinical descriptions, the differential diagnoses and the outlines of treatment. The appearance of the above 2nd edition of the Atlas is sufficient proof of its value to the general practitioner. It is well got-up, beautifully printed with excellent colour plates. It is claimed, and perhaps with every justification, that the colour plates are superior to any as yet produced by other processes. We have great pleasure in recommending this book to all medical men.

A Correction

In the Case notes relating to "A patient addicted both to Opium and Cannabis Indica," published in the October issue,

under the heading 'Points of interest' at the end of para 1 please read 4 ounces for 1½ ounces and B₁ for B₂ in line one of para 2.

News and Notes

The XXI All India Medical Conference, Cawnpore—The XXI All India Medical Conference will be held at Cawnpore on the 26th, 27th, 28th and 29th December, 1944, in the D. A. V. College, Civil Lines, Cawnpore.

In the open session of the Conference, matters of vital interest to the profession will be discussed. Members and delegates who intend to move resolutions at the conference should send a copy of the same to the Honorary Organising Secretary, Reception Committee, The Mall, Cawnpore, so as to reach him not later than December 10, 1944 with copies to the Hony. General Secretary, Indian Medical Association.

Members and delegates who desire to attend the Conference are particularly requested to intimate the dates and time of their arrival at Cawnpore Central in advance.

Visitors and delegates should provide themselves with warm clothes, beddings and at least two blankets.

Arrangements for the boarding and lodging of the delegates and the visitors have also been made in the D. A. V. College Hostel opposite the College and also rooms can

be reserved in Hotels on previous notice. Delegates intending to read papers on scientific subjects should send copies of the same to the Secretary, Scientific Section, before the 15th Dec. '44. An exhibition of Pharmaceutical Chemicals will also be held.

All India Essay Competition (1944-'45)

Subject: *Medical Post War Reconstruction with special reference to curriculum of teaching and division of labour of practitioners.*

This essay competition is conducted by the K. G. M. C. Clinical Society and is open to all bonafide students of all Medical institutions of India.

The essays should not exceed 20 handwritten or typed foolscap pages.

The last date for submitting essays is 23rd December 1944.

A prize of Rs. 60 will be awarded to the competitor whose essay stands first in order of merit. Full details can be had from BHARAT SINGH, Hony. Secretary, K. G. M. College Clinical Society, Lucknow.

Announcement

The Eastern Drug Co., Masulipatam, have the pleasure to announce that they have introduced new lines of manufacture including Synthetics to meet the growing demand

for their products. Their business will hereafter be conducted under the name and style: **Eastern Drugs & Synthetics**, Masulipatam. Telegrams: "SYNTHETICS."

Notice

Change of Address—The Manager of THE ANTISEPTIC requests the readers of the journal to promptly intimate to him any change in their addresses. As the journal is published on the 15th of every month, the intimation should reach him at least 3 days earlier.

Non-receipt of Copies—Non-receipt of copies should be intimated to him before the end of the month, failing which he may not be able to supply a copy for the second time.

Wanted

Applications are invited for the post of a full-time Registrar for the Sind Nurses Midwives and Health Visitors Council.

QUALIFICATIONS—A medical graduate with administrative experience for five years or more, or a fully trained nurse with experience of hospital administration and office management for at least five years.

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The candidates may be required to appear at their own expense at Karachi for interview.

Applications stating age with copies of certificates and testimonials (which will not be returned) should reach the President, Sind Nurses, Midwives and Health Visitors Council, Strachan Road, Karachi, on or before 15th January 1945.

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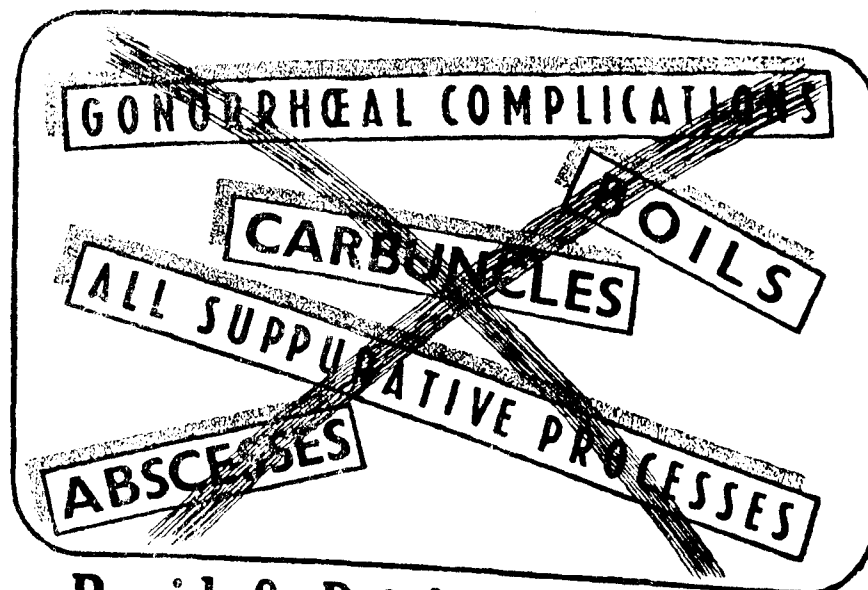
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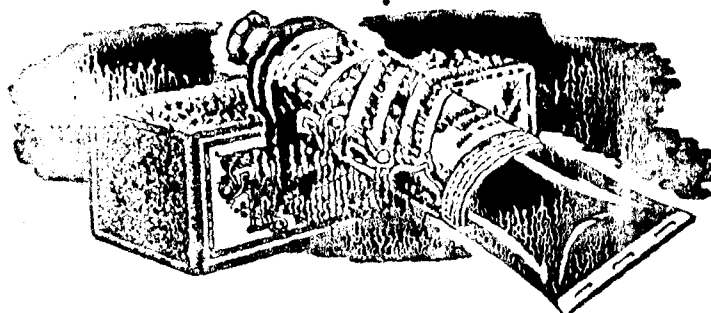
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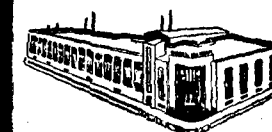
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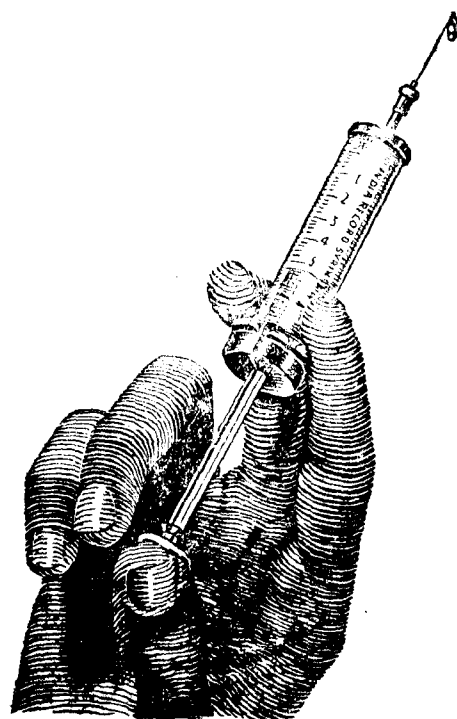
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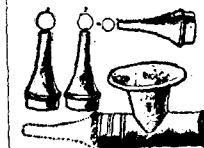
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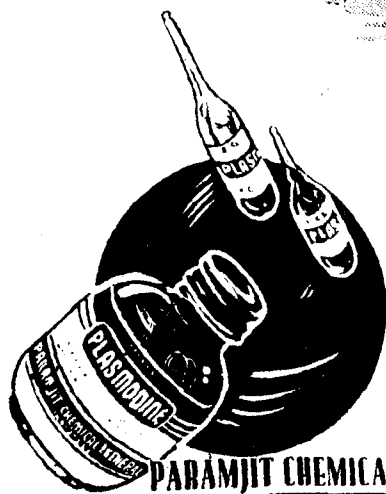
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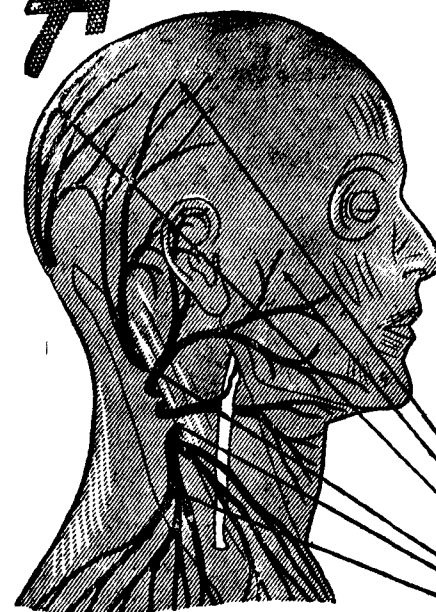


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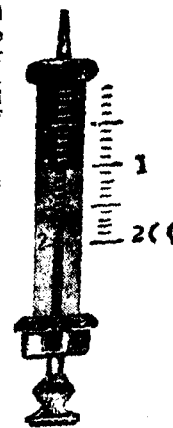
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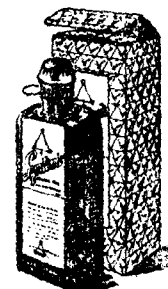
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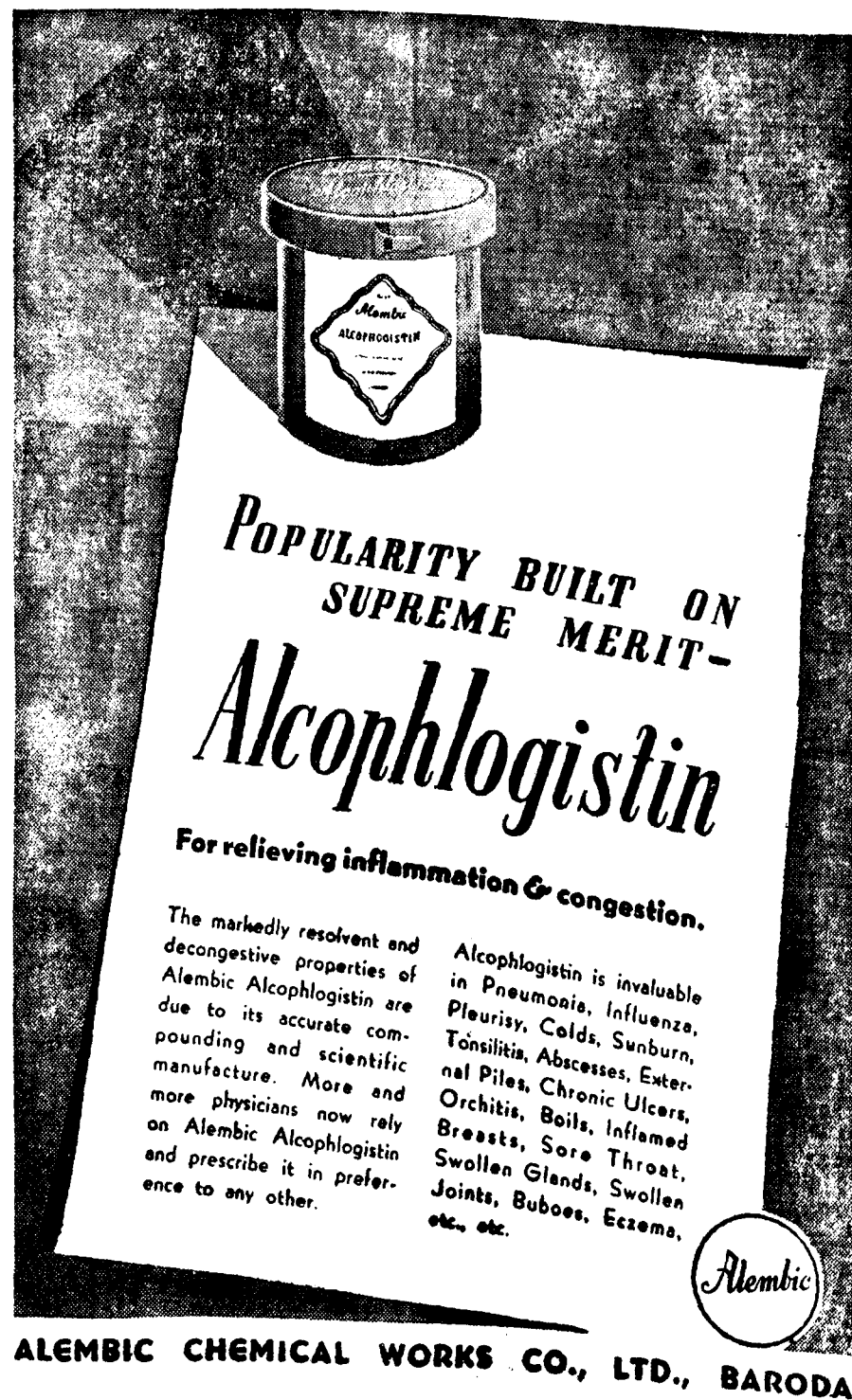
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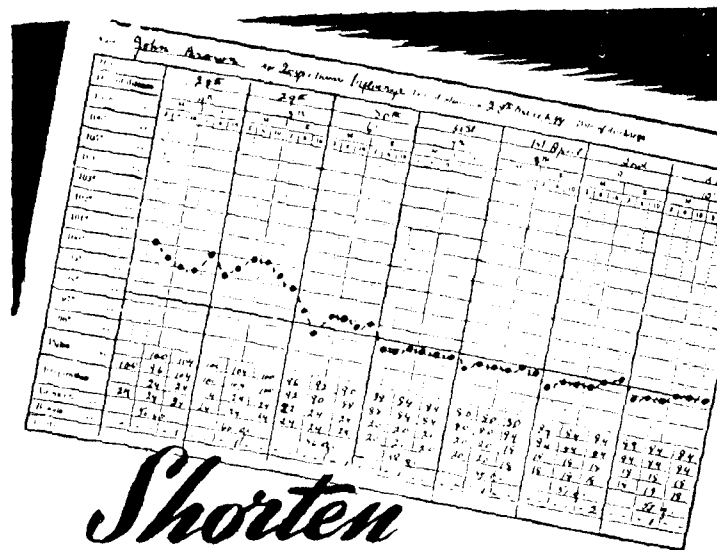
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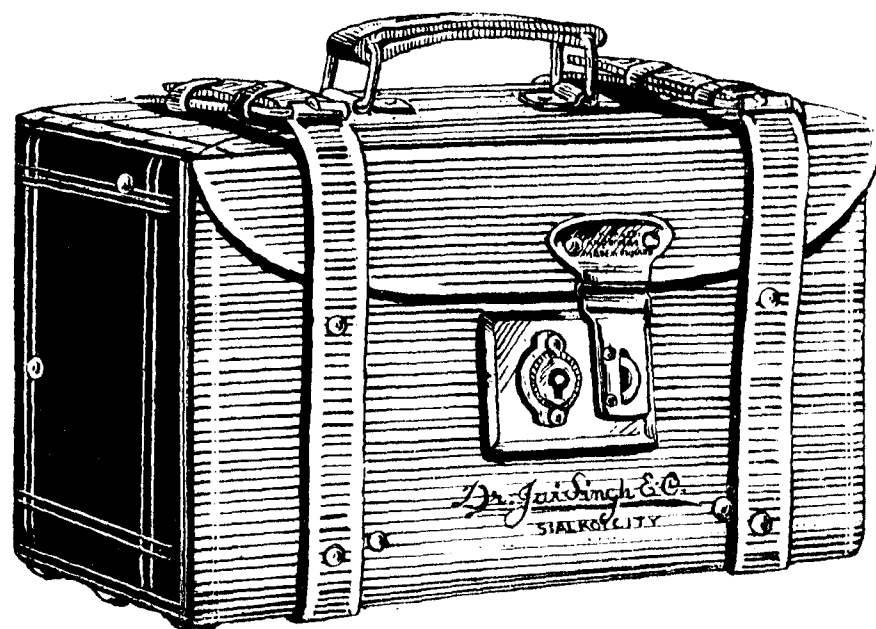
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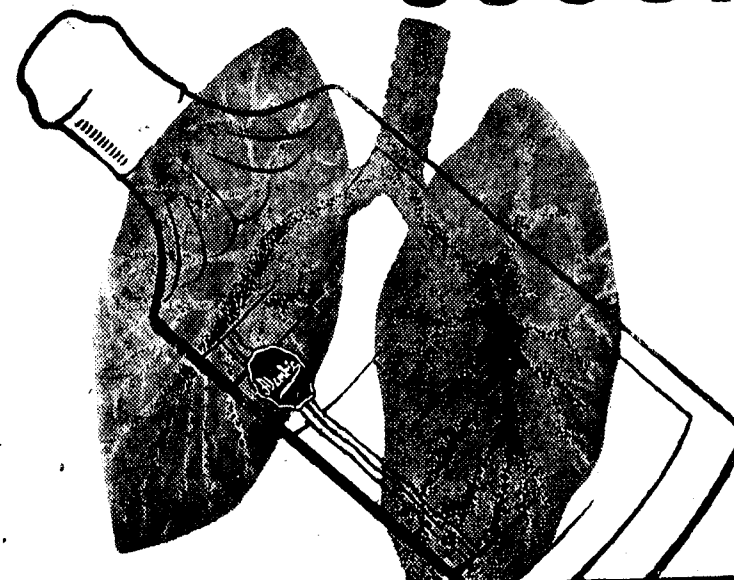
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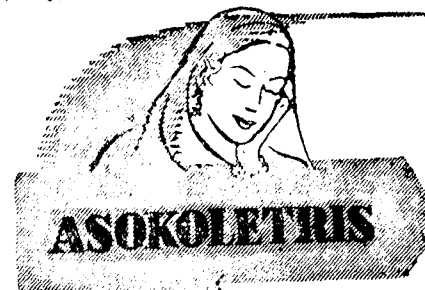
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(Journal of Clinical Endocrinology, April, 1942, p. 254)

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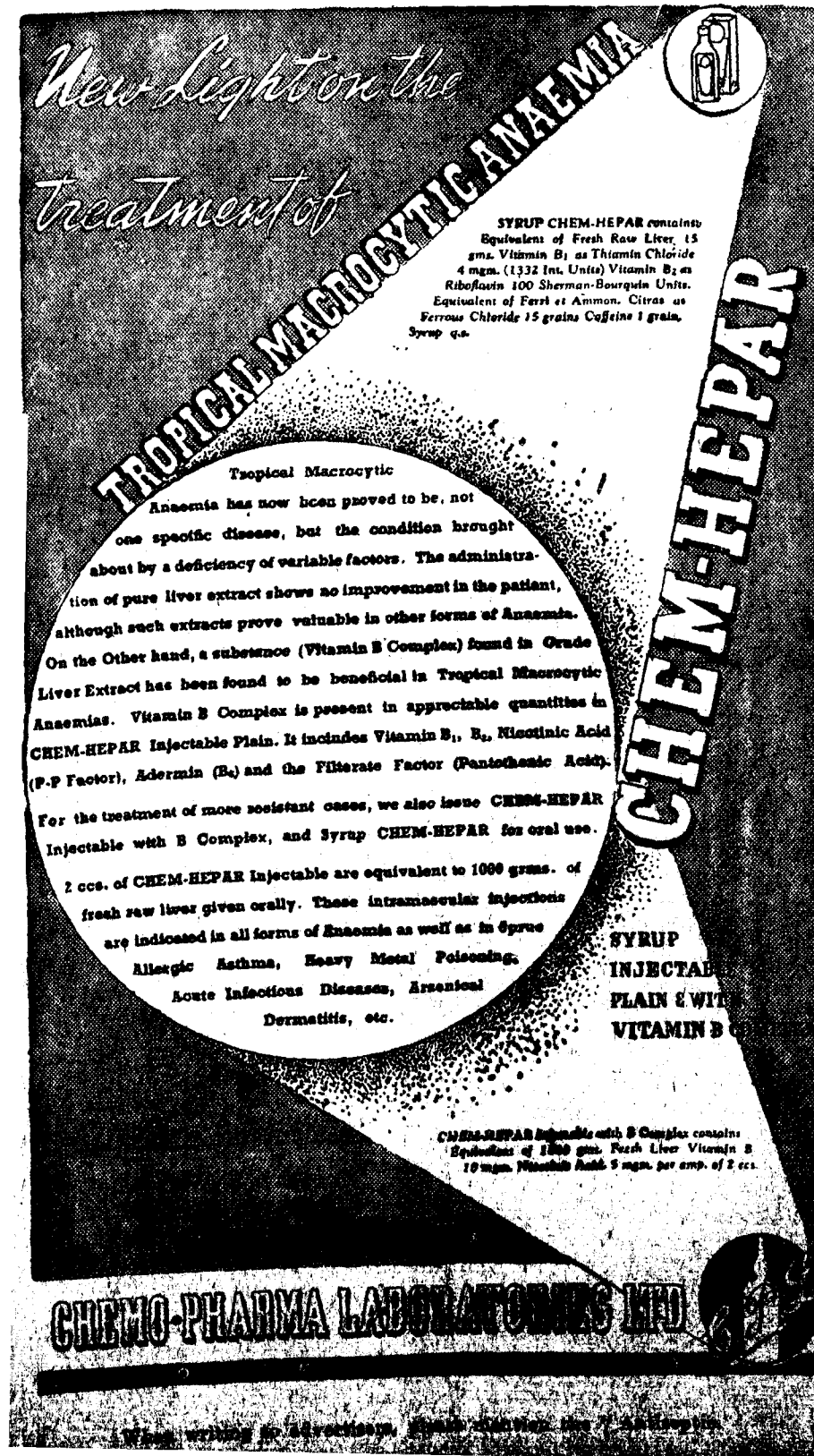
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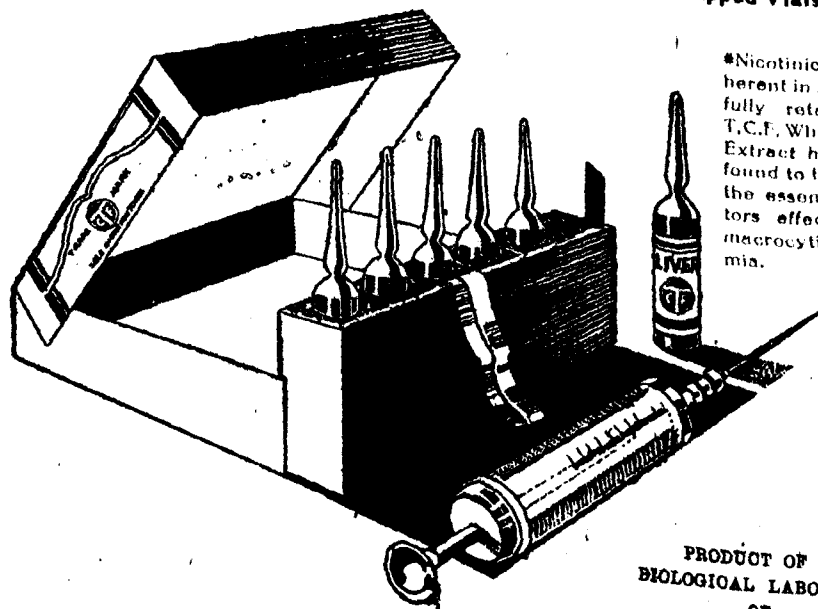
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Original Articles

Gastric Analysis on South Indians*

M. C. VARIYAR, M.Sc.,†

LT.-COL. M. M. CRUICKSHANK, M.D., F.R.C.S., F.R.S. (Edin.), I.M.S.,

AND

A. S. MANNADI NAYAR, M.B., B.S., Ph. D. (Edin).

(From the Department of Biochemistry, Medical College, Madras).

PART III

Observations on some factors influencing gastric acidity.—Gastric acidities in normal and certain pathological cases among South Indian subjects have been previously reported (VARIYAR and MANNADI NAYAR, 1944; VARIYAR, CRUICKSHANK and MANNADI NAYAR, 1944-a; VARIYAR, CRUICKSHANK and MANNADI NAYAR, 1944-b). Some of the observations recorded during these investigations throw light on certain factors influencing gastric acidity, and are discussed in this paper. Deviations from normal acidity naturally fall into the two groups hyper and hypo-acidities. Higher acidity may result by the operation of either positive or negative factors. The only factor which *per se* contributes to augmented acidity is an abnormal secretion by the acid secreting cells of the gastric wall. Two such cases are reported later in this paper. Negative factors causing hyper acidity result from the failure of regulating mechanisms which normally reduce gastric acidity—failure of duodenal regurgitation and of alkaline secretions from the pyloric region and mucoid glands, brought about by obstruction or otherwise. Dilution of gastric contents, whatever its cause may be, is another factor which indirectly lowers acidity, while gastric fermentation and the presence of lactic acid are other factors which determine the acidity status of the gastric contents.

However, the range of variation in gastric acidity in comparable normal groups or in similar pathological conditions is so wide, and their demarcation zone so indefinite that before discussing in some detail the

* Specially contributed to 'The Antiseptic.'

† Part of the thesis "Gastric Analysis on South Indians" which formed the basis of the award of the Degree of Master of Science in the University of Madras in 1941.

physiological factors influencing such acidity, it is necessary to draw attention to certain sampling and analytical errors which may creep into gastric studies unless suitable precautions are taken. Analytical errors, chiefly caused by an uncertain end-point in titration, can largely be eliminated by care in preparation of reagent, and adopting standard volumetric titration procedure. Correct sampling is a point of utmost importance, and defective sampling technique has been the cause of much confusion in this field of study. Among the chief errors vitiating results are: (a) administration of the test meal before completely emptying the stomach contents; (b) variation in the volume of meal administered to different subjects; (c) inaccuracies in the use of the Ryle's tube while withdrawing samples; and (d) insufficient duration of sampling.

Of these, the error arising from first cause cannot be over-emphasised. It is particularly to be noted that unless the operator is experienced, the occasional blocking of the fine bore of the Ryle's tube by mucous or food particles, or the crimping of the tube due to spasm, is likely to be mistaken for the complete emptying of stomach contents. In some such cases of incomplete emptying, the percentage acidity goes on decreasing for about an hour, and then slowly climbs up. The second factor will introduce errors unless a standard volume of gruel is consumed in toto by all the experimental subjects; similarly it is essential that the tip of the Ryle's tube is kept at the same level in the stomach for every sampling. Since it is generally recognised that the normal emptying time is $1\frac{1}{2}$ hours to $2\frac{1}{4}$ hours, it is rather unfortunate that a 2 hour sampling time has been adopted by some workers for routine investigations. In such cases the usual tests for the presence of starch lose their regular intervals till the stomach contents are fully emptied, but for various reasons this is not practicable. It is therefore necessary to restrict the sampling interval to the maximum normal emptying time, viz., $2\frac{1}{4}$ hours, and measure the fluid remaining in the stomach at this time. This latter observation serves to classify appropriately the type, e.g., normal or delayed emptying, and is of particular value in duodenal ulcer patients who experience acute pain and discomfort about an hour after ingestion of the test meal.

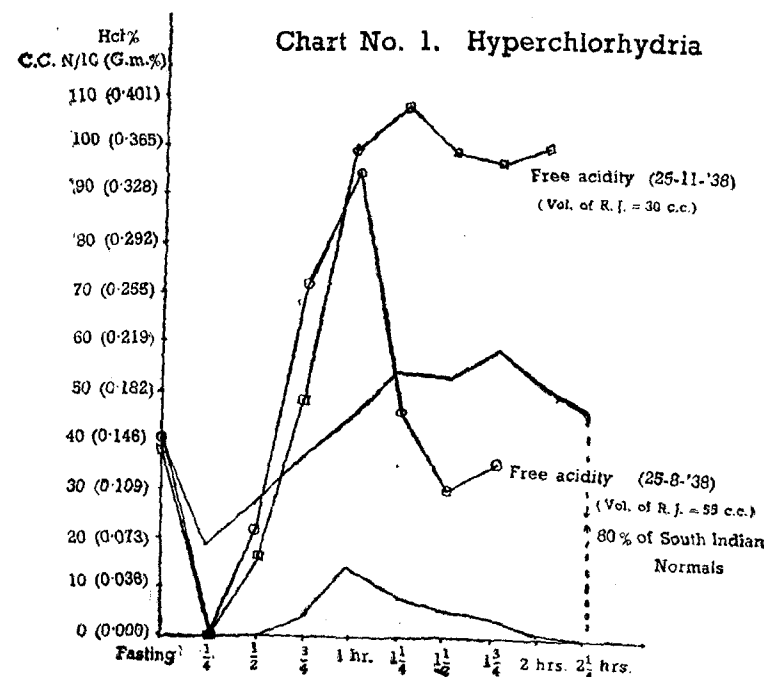
While the limitations of the experimental technique outlined in the preceding paragraph apply to all studies in gastric analysis, they are particularly important in assessing the relative role of the various factors influencing acidity.

Hyper acidity cases.—Two cases of hyper acidity were encountered during these studies; neither patient had any noticeable lesions or other pathological symptoms, although the gastric acidity was greatly in excess of the normal values reported by VARIYAR and MANNADI NAYAR, 1944, for this group of South Indian subjects.

Chart No. 1 (vide page 687) shows graphically the hyper acidity of a patient (age 44 years), who complained of epigastric pain $\frac{1}{2}$ to 1 hour after each meal, and also at night. The usual alkaline treatment was not only ineffective, but after three months of treatment, the maximum HCl per cent. shot up from 95.3 c.c. N/10 HCl per cent. to 108.92 c.c. N/10

Four tests were carried out on the second patient (age 40 years), who

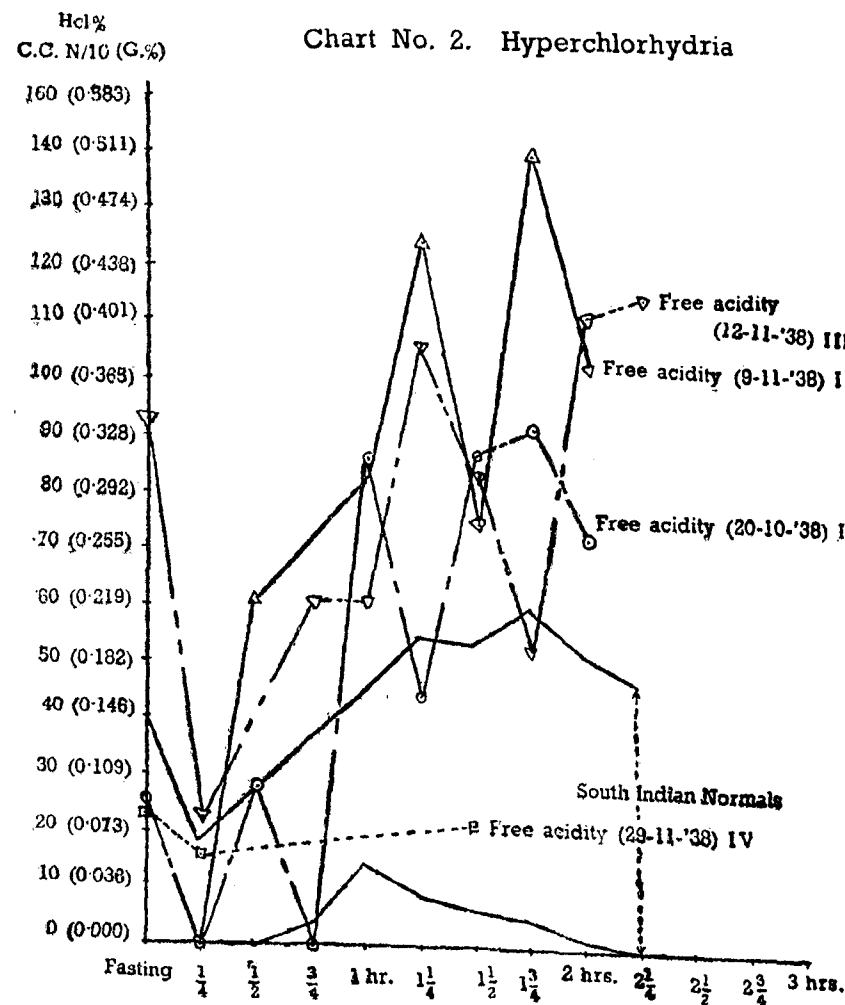
was also having alkali treatment throughout the period of study. The results are shown in *Chart No. 2 (vide page 688)*. It should be mentioned that on the last occasion, where comparatively low acidity values were recorded, no fluid could be syringed out from the stomach at $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{3}{4}$ and 2 hour intervals because of the crimping of the rubber tube due to spasm. It will be seen that on one occasion the free acidity reached the peak figure of 140 c.c. N/10 HCl per 100 c.c., a value which is the mean normal + 6 times the standard deviation, and is perhaps the highest



free acidity so far recorded in any case without detectable lesion or any other associated pathological condition.

It is generally conceded that the acid tolerance of the stomach is fairly high, and that hyper acidity can occur in normal cases. Thus, in the 100 normal cases examined, BENNETT and RYLE (1921) found 8 hyperchlorhydria cases of which 5 belonged to the climbing class usually encountered in pathological conditions such as duodenal ulcer. In the previous series of this study it was reported that 14 hyperchlorhydria cases were found in 63 experimental (normal) subjects, of which 9 gave climbing curves. In this connection it is of interest to note that attempts of HARDY (1929) to produce gastric pain artificially by introducing 200 c.c. of 0.5% HCl through a Ryle's tube were unsuccessful. While these studies no doubt indicate that normal persons can have hyper acidities and that the acid tolerance of the stomach is great it is rash to assume without definite experimental evidence that the stomach can tolerate with impunity high acid concentration for prolonged periods. Although various theories have been propounded, it is not yet definitely known how ulcers arise. Ulcers are generally found in the regions to which free acidity has a very great access. It is therefore probable that ulcers once formed (it is immaterial by what cause they are produced) will become chronic more

quickly by this high gastric acidity. It will therefore be interesting to ascertain whether such a high concentration of acid is ever secreted by a normal stomach, and, if so, in what percentage of normal cases; or, if it is not the production of a normal stomach and the appearance of high acidity is only a prelude to the development of pathological conditions,



what those conditions are and when they would arise. Unless experimental evidence based on the work of a very large number of cases having such hyper acidities with no noticeable abnormalities come to our aid it is impossible to give definite answers to these questions.

Some factors lowering gastric acidity.—The lowering of gastric acidity and the factors contributing to it has been a controversial field of study among various workers. According to BOLDYREFF (1914) hyperacidity was due to defective neutralization. SPENCER and his collaborators (1926) and CROHN (1918) supported this view and suggested absence of regurgitation from the duodenum as the main cause for such high acidities. BENNET and RYLE (1921) and BOLTON and GOODHART (1922) also accepted this view. HUNTER (1923) found "climbing acidity" in 7 out of 8 cases of gall stones obstructing the common bile duct and ascribed this to the

absence of bile and pancreatic secretion. McC. BAIRD and co-workers (1924) suggested that greater importance should be attached to the alkaline secretion of the pyloric part of the stomach. BOLTON and GOODHART (1922) said that in the absence of the estimations of total chlorides a proper interpretation of the data obtained from hyperchlorhydric and achlorhydric cases cannot be made. RYLE (1921) said that it was doubtful whether the pyloric sphincter was ever closed at all completely and suggested that the relaxation of the sphincter alone would not allow regurgitation if the presence of the "pars pylorica" did not fall at the same time below the pressure in the duodenum. He said that in "hypertonic" or "steerhorn" stomach the high position of the pars pylorica opposed duodenal reflex while the low position of the latter in the "hypotonic" or "j" shaped stomach facilitated it, especially in the erect posture, and added that the above views were supported by the fact that gastro-jejunosomy did not necessarily abolish hyperacidity as it should do if the sphincter alone were its cause. HUGH MACLEAN (1928) says, "duodenal regurgitation when it occurs, is an accident.....It is not connected with the reduction of HCl and the associated rise of neutral chloride which occurs during digestion." NORRIS and APPERLY (1930) showed by performing a test meal using neutral substance as a dilution indicator and HCl as the neutralising indicator that evidence of neutralization was present in 24 out of 37 cases in which N/10 acid was introduced into the stomach. HOLLANDER (1932) found a straight line relation both in cases of total acidity and total chloride concentrations, and in the total acidity and neutral chloride concentrations in gastric juice obtained from Pavlov's pouches, thus indicating a simple mathematical relation between acidity and chloride when gastric juice was not contaminated with the duodenal contents, etc. He found that the concentration of the total chloride content diminished with acidity and that the maximum acidity that a solution of HCl which contained no neutral chloride but was isotonic with blood. FRANCIS MACLAGAN (1934) suggested (a) that duodenal regurgitation did not play an important part in the neutralization of gastric acidity, (b) that dilution alone could not reduce gastric acidity, and (c) that the first rise in acidity curves corresponded to the most acid secretion, which probably came from the fundus and that towards the end of the meal an alkaline secretion would begin to appear, perhaps from the pyloric region or from the mucoid glands.

Duodenal regurgitation.—In the present investigation tests, for both bile and trypsin were conducted in 110 cases (32 normal and 78 pathological). In all 1,047 samples were examined in this connection, and out of these 281 samples or 26.8 per cent. showed presence of trypsin alone, 70 samples or 6.7 per cent. bile alone, 232 samples or 22.2 per cent. both trypsin and bile and 464 samples or 44.3 per cent. neither trypsin nor bile were found. In cases of marked obstruction at the pylorus, bile and trypsin were completely absent in the samples, while in all other cases they were usually absent only in the earlier samples.

Bile without trypsin was usually present either in the resting juices where the duodenal regurgitation would have taken place sometime ago so that trypsin was destroyed, or in the samples having high acid concentration. However, in a few samples with low acidity bile was present without trypsin. Only 67 of the total samples examined showed the presence of bile alone, and leaving out the cases which had acidity over

20 c.c. N/10 HCl per cent., only five or 0.48 per cent. of the samples examined contained bile alone.

Taking all samples containing trypsin into account it was found that 281+513 samples had trypsin while only 70+232 or 302 samples showed the presence of bile. Both trypsin and bile are due to regurgitated duodenal contents, but while only 6.7 per cent. of the total samples showed the presence of bile alone, 26.8 per cent. of the samples were positive for trypsin alone. This indicates that absence of regurgitation can be inferred only if the gastric samples contain neither bile nor trypsin and that trypsin is a more reliable indicator of duodenal regurgitation than bile. The usual tests made for the detection of bile are less sensitive than the tests for trypsin. It is therefore possible that some of the samples included in the "trypsin" group here may go into "trypsin+bile" group if a test sufficiently sensitive to detect minute amounts of bile be applied. But the fact that such a large percentage of the cases containing trypsin failed to show the presence of bile suggests dissociated regurgitation.

Total chlorides were estimated in the samples taken from 123 persons in all. Total chlorides in resting juice varied from 125 mg. to 945 mg. per 100 c.c. with an average value of 614 mg. per 100 c.c. There is evidence of neutralization since the chloride values climb up steadily in spite of fall in acidity. However, there is no linear relationship between acidity and total chlorides. A few cases of extreme discrepancies are listed in pairs in Table No. 1 where the bracketed values were obtained from the same patient, and were, on most occasions, consecutive observations.

TABLE NO. 1

Total acid	Total chloride	Total acid	Total chloride	Total acid	Total chloride
{ 11.78 c.c.	105 mg.	{ 47.85 "	610 "	{ 48.60 "	747 "
{ 11.28 "	254 "	{ 51.80 "	610 "	{ 58.12 "	687 "
{ 42.40 "	295 "	{ 85.16 "	688 "	{ 68.65 "	795 "
{ 43.50 "	395 "	{ 85.40 "	687 "	{ 79.40 "	795 "
{ 56.80 "	380 "	{ 104.00 c.c.	722 "	{ 91.65 "	835 "
{ 62.60 "	380 "	{ 51.00 "	713 "	{ 59.20 "	825 "
{ 68.37 "	532 "	{ 66.30 "	725 "	{ 109.65 "	861 "
{ 63.13 "	532 "	{ 66.00 "	695 "	{ 109.42 "	881 "
{ 80.08 "	604 "	{ 45.70 "	740 "		
{ 80.62 "	646 "	{ 53.50 "	740 "		

An examination of the results showed that 16 samples containing mucus alone, 31 samples containing trypsin alone, 12 samples containing bile alone, 8 samples containing both trypsin and mucus, 45 samples containing bile and trypsin and 23 samples containing neither mucus, trypsin nor bile showed increased chloride values for decreased acidity values. Thus, of 135 samples, 11.9 per cent. showed decreased acid values with mucus alone, 5.9 per cent. with mucus and trypsin, 23.0 per cent. with trypsin alone, 8.9 per cent. with bile alone, 33.3 per cent. with bile and trypsin and 17.0 per cent. with neither mucus, trypsin nor bile. Now, since trypsin and bile come from the duodenum, grouping all the samples containing bile, trypsin or both it is found that 71.1 per cent. of the cases

showing increased chloride values with decreased acid values had duodenal regurgitation and 17.0 per cent. neither mucus nor regurgitation. The samples containing mucus invariably showed decreased acid and increased chloride values showing thereby that mucus is an acid-decreasing agent. The fact that 17.0 per cent. of the above cases contained neither mucus nor regurgitated duodenal contents shows that in addition to these two agents there is another which reduces acidity and increases neutral chlorides. This can be attained only by one of two ways, namely, (a) neutralization by an alkaline and mucus-free fluid, or (ii) dilution by neutral chloride. As MACLAGAN says, dilution alone is out of question. Hence one of the factors contributing to reduction of acidity seems to be neutralisation by an alkaline but mucus-free fluid secreted into the stomach. It is, however, impossible to state definitely from the results of fractional test meal alone whence this fluid is secreted; neither is it possible to say whether neutral chloride is secreted or not.

Leaving aside all the samples taken $\frac{1}{4}$ hr. after administration of the meal 48 samples showed decreased values both for acidity and for total chlorides. Of these, 35 or 72.9 per cent showed evidence of regurgitation while 13 or 27.1 per cent. did not. Now, decrease in both acid and chloride values can only be explained by either dilution or decreased acid secretion. For reasons stated by MACLAGAN dilution alone cannot be responsible for the lowering in acidity in these cases. Therefore, the cause for low values in the acidities and total chlorides is to be looked for in the decreased acid secretion.

RYLE (1926) reported that active fermentations occurred in the fractional samples obtained from his patients on three occasions and that in each case the diagnosis was pyloric stenosis or obstruction. He says, "Fermentation is said to be more common in obstructive carcinoma on account of the absence of free HCl, but I have met with it also in pyloric stenosis following the swallowing of a caustic alkali; in each instance free acid was shown to be present."

In our series fermentation was due to marked obstruction and free hydrochloric acid was present.

Fermentation.—On three occasions the specimens collected showed active fermentation. All these were cases of pyloric obstruction and the emptying time in each case was over three hours. All the samples contained free hydrochloric acid.

Lactic acid.—Out of 135 persons examined 18 had definite food retention and consequent presence of foul smell in the resting juice. Two of these cases showed presence of lactic acid. Lactic acid was also present in the cases of gastric syphilis and gastric carcinoma. The two cases of pyloric obstruction which contained lactic acid showed active fermentation, and the residues of the specimens collected were black though the upper layers of the specimens were clear. In the case of gastric cancer the stomach appeared to empty normally. The gastric syphilitic case had delay in emptying. In the other cases, though there was delay in emptying, lactic acid was absent. These facts show that lactic acid was not characteristic of any particular disease, but is only an indication of food retention. However, in all cases of food retention lactic acid is not invariably present.

Pepsin content.—Although pepsin is not a factor influencing gastric acidity a discussion about it is given here because of its importance in the digestion of proteins in food and of the parallelism its values show with the free acidity values.

Pepsin was estimated in the samples taken from 19 patients. Five were of duodenal ulcer without complications, 4 of duodenal ulcer with pyloric obstruction, three of appendicitis and one of anastomotic ulcer. The diagnoses of the remaining cases were not confirmed by other methods. Table No. 2 gives the acidity and pepsin values of the samples taken from the confirmed cases.

TABLE No. 2

DISEASE		Time at which samples are taken										
		Fasting	4 hr.	4 hr.	4 hr.	1 hr.	1 1/4 hr.	1 1/2 hrs.	1 3/4 hrs.	2 hrs.	2 1/4 hrs.	2 1/2 hrs.
Duodenal ulcer	T.	65.3	23.1	26.6	35.0	—	43.3	50.2	58.3	—	68.0	—
	P.	320	40	40	80	—	80	80	80	—	160	—
	T.	14.8	14.3	14.3	21.7	27.9	37.1	39.4	37.6	44.3	50.8	39.2
	P.	329	80	80	160	160	320	80	160	400	640	360
	T.	62.6	4.6	22.3	32.0	44.6	17.8	21.2	24.6	34.2	30.1	—
	P.	128	8	64	64	128	64	64	128	128	64	—
	T.	53.6	3.6	49.7	39.4	48.8	54.6	55.7	87.4	79.3	61.9	—
	P.	295	20	20	40	40	80	80	160	160	80	—
	T.	59.5	24.0	34.3	39.6	44.8	43.4	44.3	42.9	43.0	43.4	—
P.	320	160	160	160	80	40	128	64	80	128	—	
Duodenal ulcer and Pyloric stenosis	T.	64.3	22.7	22.4	41.0	45.0	50.6	57.1	57.8	63.4	60.2	62.2
	P.	320	40	64	64	120	128	64	64	64	64	64
	T.	50.8	6.2	8.7	8.7	10.3	15.7	18.3	23.9	28.7	31.9	32.7
	P.	128	8	8	8	8	16	8	16	32	16	32
	T.	32.5	5.0	26.2	21.8	23.5	33.8	41.3	50.9	64.1	45.5	—
	P.	256	128	64	64	128	128	140	128	128	128	—
	T.	37.1	22.2	39.5	50.2	62.8	65.4	87.0	—	—	—	—
	P.	20	7	6	10	20	35	40	—	—	—	—
	T.	44.9	14.9	25.7	66.3	75.0	—	9.6	6.6	9.5	—	—
P.	160	40	20	40	80	—	10	10	—	—	—	
Appendicitis	T.	33.0	8.4	16.2	26.9	35.1	30.7	—	—	—	—	—
	P.	160	10	40	40	20	40	—	—	—	—	—
	T.	27.1	7.3	8.7	18.3	24.4	—	—	—	—	—	—
	P.	160	6	8	40	45	—	—	—	—	—	—
	T.	160	—	—	—	—	—	—	—	—	—	—
Anastomotic ulcer.	T.	80.8	49.7	56.4	75.7	75.0	49.7	80.7	51.2	51.4	—	—
	P.	80	20	20	20	20	20	20	40	40	—	—
No illness.	T.	2.1	1.6	2.0	3.6	9.1	—	—	—	—	—	—
	P.	8	2	6	40	80	—	—	—	—	—	—

Note:—"T" stands for total acidity, and "P."

Note:—"T" stands for total acidity, and "P" for pepsin.

The figures for acidity are in c.c. and those for pepsin in units.

The acidity and the pepsin values showed that the pepsin content of the resting juice was high irrespective of the acid concentrations while those of other samples varied almost directly with the concentration of the HCl in the contents. Wide variations existed in the quantity of pepsin in the samples. Thus, for example, in the resting juice, its minimum value was 20 while its maximum value was 320 and the average 180. But generally, duodenal ulcer cases had high pepsin content in the gastric samples, especially in the resting juice.

The average values for total acidity and pepsin found in 23 normal and 19 pathological cases examined are given in Table No. 3:

TABLE No. 3

	R. J.	Time at which samples are taken										
		4 hr.	4 hr.	4 hr.	1 hr.	1 1/4 hrs.	1 1/2 hrs.	2 hrs.	2 1/4 hrs.	2 1/2 hrs.	2 3/4 hrs.	3 hrs.
Normal cases.	(T. A.)	17.9	5.4	14.8	21.5	31.6	40.7	37.6	41.1	45.1	37.7	—
	(Pepsin.)	240	39	166	196	280	279	289	438	283	232	—
Pathological cases.	(T. A.)	41.2	15.7	25.7	35.5	41.1	40.2	42.8	42.5	44.9	44.7	41.1
	(Pepsin.)	180	54	48	59	80	104	102	112	124	138	99
												64

As the method for the estimation of pepsin was not so accurate as that of acidities, the average value for pepsin was given only correct to the whole number.

The variation of pepsin content did not depend on the concentration of acid alone; there were individual variations too. In the same patient the pepsin content was almost directly proportional to the acid concentration of the sample, but the results obtained from the samples of one patient were at times slightly different from those obtained from another. In the anastomotic ulcer case though the acidities were very high the pepsin contents were small.

Our values for pepsin in the pathological and normal cases indicate that peptic ulcer patients do not have higher pepsin content in their gastric samples. Since equally high acid and pepsin concentrations are found in the gastric samples of normal and peptic ulcer cases, in all probability some factor other than these two might be the real cause of peptic ulcers.

Summary.—A brief resume of the factors influencing gastric acidity is given, and details of two interesting cases of hyper acidity are given. The role of duodenal regurgitation in lowering gastric acidity has been studied by examining the gastric contents for bile and trypsin.

2. Total chlorides were estimated in the gastric samples of 61 normal and 72 pathological cases. The chloride and acidity values showed qualitative parallelism.

3. Active fermentation was found in the gastric samples taken from three patients and all these cases had free HCl. The patients were suffering from pyloric obstruction.

4. Lactic acid was found to be present in the cases of gastric syphilis, gastric carcinoma and pyloric obstruction showing thereby that it is due to marked stagnation and is not characteristic of any particular disease.

5. Pepsin was estimated in the gastric samples taken from 23 normal people and 19 diseased persons by Fuld's method. The values were found to vary within very wide limits. In the resting juice pepsin concentration was high irrespective of acidity but in all other samples the concentration of the enzyme was found to vary directly with the acid content. There were individual variations too. Patients having duodenal

ulcers were found to have high pepsin content in the gastric sample. But such high pepsin values were found in normal persons also. Possibly some factor other than free acidity and pepsin is the real cause of peptic ulcers.

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Indian Village Obstetric Emergencies

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(Continued from page 643 of Nov. 1944 issue).

Chapter XV—Operations

1. **Things to bear in mind.**—1. Before undertaking any operation arrange for the necessary assistance.

2. In a difficult case an anæsthetic may be necessary for diagnostic purposes as well as to facilitate the operation. It is almost impossible to deal satisfactorily with most primiparæ in the absence of anæsthesia. One can dispense with an anæsthetic in many cases where a multipara is concerned.

When no competent assistant is available a Junker's inhaler will be found useful. To avoid the accidental discharge of the contents of the bottle of chloroform into the patient's face, when the bellows are wrongly connected to the outlet pipe, a Rigby-Buxton bottle with safety ball-valve should be used (Down Bros., Catalogue No. 1336/16). The Rigby-Buxton bottle must be tied to the bed, a chair back, or some article of furniture, so that it hangs vertically in full view of the operator but out of reach of the patient.

The patient holds the mask over her face and works the bellows. As she loses consciousness she ceases to pump until she regains sensibility when she recommends to compress the bellows. This method will only produce light anæsthesia.

3. Instruments, towels, lotions, water, saline solution, and packing material etc., must be sterilized and laid out in readiness and to hand. It

is specially important to have sufficient sterile 1 c.c., 2 c.c., 5 c.c., 10 c.c., and 20 c.c. syringes and needles ready with the ampoules and tablets of drugs and water close by. A spirit lamp, a teaspoon and a box of matches must not be forgotten.

Chloroform and ether must always be obtained from unopened 2 ozs. sealed bottles or ampoules. Old chloroform and ether from previously used bottles are highly dangerous. Chloroform, ether and paraldehyde must be purchased in amber glass containers.

Direct droplet infection of the vulva and instruments can be prevented if the operator and all present in the room wear masks or keep their mouths shut and thus avoid speaking, sneezing or coughing.

The vulva should be kept covered as much as possible by a dry sterile pad, or, if this is not available, by a cloth wrung out in a 1 in a 1,000 solution of some flavine. The skin around the vulva must be prepared and treated with the same care as the vulva. A superlative cleansing agent is Ether. Ether which is too stale for anæsthetic purposes may be used.

It is easier to keep things sterile if they are dry but this is usually impossible in domestic obstetrics.

Comfort is necessary for efficiency. This is achieved by careful preliminary arrangement of the light, the patient and the tables etc., on which the instruments are laid out.

Precautions must not be relaxed in cases which are already septic. Gloves, instruments etc., must be sterilised by being boiled, completely immersed in water, for at least 5 minutes. The addition of 3 drachms of washing soda to each pint of water (2% solution) diminishes the rusting of the instruments and is more lethal for bacteria.

Bowls, basins etc., may be sterilised by being painted rapidly all over the inside with methylated spirits and the small quantity of the spirit, which remains in the bottom, quickly lighted so that the flame passes all over the interior and rim.

Water-proof sheeting if it cannot be boiled must be sponged over with a clean cloth soaked in a solution of $\frac{1}{2}$ oz. of Lysol (made by a firm of repute) in one pint of water. The lysol solution must be washed off by water, which has been boiled, before the patient is laid on the sheet to avoid damaging the patient's skin.

Saline and other weak lotions must be sterilised by boiling and great care is needed to prevent their subsequent contamination.

Although 70% alcohol, is the most lethal dilution, spores of bacteria can live in it.

Syringes and needles must be sterilised by boiling. It is highly dangerous to keep needles and syringes for intramuscular injections in spirit. Cases of tetanus have resulted from this practice.

4. Two chairs placed back to back but a couple of feet apart make useful leg rests.

5. To hold the patient's legs in the lithotomy position, in the absence of two assistants or a Clover's crutch, place the centre of a sari under the patient's shoulders so that the weight of the shoulders rest upon it. Knot the ends of the sari round the legs of the patient just below the knees.

When using a Clover's crutch apply the apparatus so that the cross bar fits distal to the knees.

Portable leg rests which can be clamped to the sides of a bed or *charpoy* have been designed by Dr. BERNEL SOLOMONS and are supplied by Messrs. FANNIN, Grafton Street, Dublin, Eire.

6. The operator's hands and the patient must be prepared as described in Chapter I. 11, 12, 13 and 14 and in Chapter III. 17. A strong solution of a soap such as "Sun Light" has a considerable bactericidal effect if applied vigorously for 5 minutes but no antiseptic can harm spores.

The surface of a cake of soap is usually contaminated but when the outer layer is washed off the underlying soap is sterile until brought into contact with septic material.

Boil 6 squares of towelling (each twice the size of a hand), 40 to 50 balls of surgical tow (each the size of a thumb) and the same number of balls of cotton wool (each the size of a thumb). If no fire is available the above may be left steeping in 30% "Dettol" solution for as long as possible.

While the above are being boiled, if the vulval region is hairy shave it.

The squares of towelling are for the initial application of soap and water to the vulval and perineal regions.

The balls of tow are for scrubbing down the skin with antiseptic solution. The balls of cotton wool are for cleansing the mucous surfaces with antiseptic.

The whole pubic region, groins, vulval area, medial aspect of the upper thighs and anal surroundings must be *thoroughly* washed from the ventral aspect towards the dorsal or buttock region using squares of sterile towelling and abundant soap.

During this washing one screwed up square of towelling must be held in position over the vaginal and urethral openings to prevent dirty water entering.

Once a square of towelling, which is being used for scrubbing down the perineum, has touched the anal surroundings it must be discarded in favour of an unused square.

When the soap has been washed away by sterile water or antiseptic solution the whole of the above skin surfaces and the vaginal and urethral openings must be scrupulously swabbed down with 30% "Dettol" or "Dettol" obstetric cream. As soon as a swab touches the anus it must be thrown away immediately and a clean swab brought into action. The anal region requires very careful disinfection to avoid contaminating the adjacent areas.

The "Dettol" must be allowed to dry on the surface. Some people prefer to paint the entire area with Tincture of Iodine. If this is to be done it should be deferred until after the vagina has been douched or the Iodine will be washed off.

The vagina must be thoroughly douched with 5% "Dettol" or "Cyllin." In order that the fluid may reach every nook and cranny the operator must insert the index and middle finger of one hand to open up

and spread out the vagina. The fornices must not be forgotten. The nozzle must be passed up into each in turn and worked around thoroughly.

30% "Dettol", Dettol Obstetric Cream or Tincture of Iodine must be worked into all the labial, urethral and vaginal areas and left to dry after the douching is completed.

Great care must be taken to prevent the patient's buttocks and back being left lying for more than a short period of time in a pool of wet disinfectant or on clothes soaked therein. This is to save her skin from serious damage.

7. A thorough examination must be made of the presenting part, its position and of the condition of the pelvis.

8. The power of the uterus and of the abdominal muscles and the relation in size between the foetus and the pelvis must be estimated.

9. It must be decided whether it is necessary to interfere at all with the natural progress of the case bearing in mind the need for effecting delivery with the least amount of injury to the mother without needlessly sacrificing the child.

10. *A living mother and a dead child are better than a dead mother and a dead child.*

11. In carrying out vaginal examinations to ascertain the cause of delay special attention must be paid to the following points:—

(a) If the four cornered anterior fontanelle and the four sutures which join it are more easily felt than the triangular posterior fontanelle the head is *not* satisfactorily flexed.

(b) If the four cornered anterior fontanelle is nearer to the pubes than it is to the coccyx the position is occipito-posterior. Unusual roominess in the hollow of the sacrum and difficulty in feeling the small triangular posterior fontanelle confirms this.

(c) To decide the exact position a useful landmark is the pinna and helix of the ear, which point in the same direction as the occiput.

(d) A face presentation is liable to be mistaken for a breech or a shoulder because the caput may obscure the landmarks. The alveolar process inside the mouth is distinctive of a face presentation.

(e) A gripping of the finger by the sphincter ani is distinctive of the breech (the child cannot grip with its jaws).

II. Application of Willett's Forceps.—If these are not available one may substitute vulsellum, ring or tongue forceps. They will not hold so well and are more difficult to apply.

Anæsthesia can usually be dispensed with especially in multiparæ.

Indications:—Hæmorrhage in placenta prævia with cephalic presentation.

After the membranes have ruptured slow dilatation of the external "os".

After the membranes have ruptured in cases of primary uterine inertia to stimulate contractions.

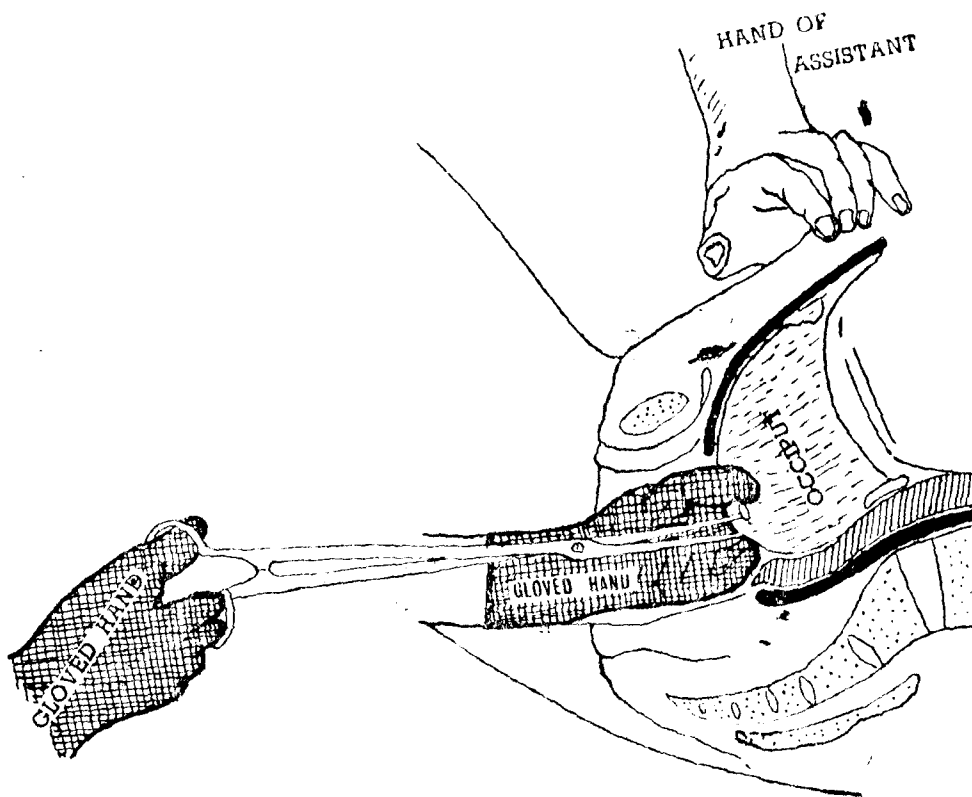
Special requirements:—(a) Willett's forceps, 2 pairs are better than one pair and (b) membrane perforator, but hæmostatic forceps such as Spencer Wells' or Kocher's or the Stilette of a catheter will do as well.

Conditions:—The external "os" must admit one finger. The operation is much easier if the "os" admits two fingers or more.

An assistant must exert fundal or suprapubic pressure to keep the presenting part as low as possible in the pelvis.

Clots must be removed from the vaginal vault. This can usually be accomplished by inserting a speculum and depressing the vulval end.

Operation:—The lithotomy posture is desirable but not essential. Introduce a whole hand or at least the index and middle fingers up to the external "os." The operation will be much easier and more successful if the index and middle fingers as well as the thumb can be passed through



APPLICATION OF WILLETT'S FORCEPS
THE SCALP IN A CASE OF PLACENTA PRÆVIA.

F. Allen
17-9-34

the external "os" up to the presenting part. The internal fingers must not be withdrawn until the operation is completed.

If the membranes are intact they must be ruptured. This is effected by passing the point of the instrument selected for this purpose, guarded by the internal fingers up to the membranes and tearing through them. (In the case of a central placenta prævia, before the fetal skin can be reached, it will be necessary to bore through the placenta with the tips of the fingers or with the tips of hæmostatic forceps. As this is not always an easy matter it is usually preferable in case of a central placenta prævia, where the child is still freely moveable, to perform external podalic version, turning the fetus so that its feet are over the maternal pelvis. An ankle is thus at hand immediately over the cervix. If the membranes are intact they are ruptured and the ankle must be seized by two or more fingers of a hand which has been introduced into the vagina. The ankle must then

be drawn out and the thigh turned until the popliteal (dorsal) surface of the knee is visible under the maternal pubis).

Introduce the blades of the Willett's forceps guarded by the internal fingers.

Endeavour to squeeze up the foetal skin into a ridge between the thumb and fingers or between the fingers of the internal hand as the external hand opens the forceps and pushes the tips of the blades firmly against the foetal skin to obtain a good bite.

In vertex presentations the blades should grip the foetal scalp as near the vertex as possible to aid flexion.

When the internal fingers have ascertained that the blades of the forceps are in correct position for holding the skin of the infant securely the external hand presses the handles together to lock the ratchet but the internal fingers must remain in position.

A proper grip on the foetal skin will only compress and bruise it. Failure to obtain a proper grip will result in the blades slipping off or tearing off a piece of the infant's skin.

If a second pair of Willett's forceps are available the second pair should be applied in a similar fashion to the first pair.

The external hand must exert light traction on the handles of the forceps while the fingers of the internal hand verify that the grip is secure. If the blades slip they must be taken off and re-applied.

When it is certain that the blades will not slip the internal hand must be withdrawn and the head of the bed raised about 9 inches. Continuous, slight tension must be maintained on the handles of the forceps. This is achieved by a tape, bandage or cord tied to the handle of the forceps and led over the end of the bed. To the free end of this cord must be attached a weight of from 2 to 4 pounds which must hang free. If a pulley is available to carry the cord over the foot of the bed only 1 or even 2 pounds weight will be required to maintain slight traction. If no pulley is at hand rather more weight will be required in order to overcome the friction.

The forceps must be removed when the presenting part is on the perineum. Tinct. Benz. Co. is the best dressing for the infant's injured skin.

III. **Packing the cervix.**—1. *Indications:*—(a) To induce abortion, miscarriage or labour; (b) to soften and dilate the cervix; and (c) to stimulate flagging labour pains in the first stage.

2. *Dangers:*—(a) Sepsis (which is the medical attendant's fault); (b) rupture of the membranes which is unfortunate but which will do no harm provided labour is not delayed; (c) air embolism; (d) in a case of placenta prævia, separation of the edge of the placenta indicated by bleeding. (Should this happen cease pushing packing into the cervix and if the bleeding is profuse pack the vagina as described below).

3. Anæsthesia is rarely required for packing the cervix alone but will be necessary if the vagina has subsequently to be packed for hæmorrhage.

4. *Special requirements:*—(a) 3 inch wide gauze, bandage cloth or fine cloth about 6 ft. in length; (b) a bowl to hold the packing material; (c) it is of advantage to have a pair of plugging or ring forceps or a Holme's or Gerota's uterine packing tube; (d) a pair of scissors; and (e) Lubefax, medicinal paraffin, Glycerine or sweet oil.

5. *Operation* :—(a) With the patient in the lithotomy posture spread the labia well apart.

(b) After thorough lubrication with Lubefax, Glycerine, etc., introduce the index and middle finger of one hand, palmar surface towards the mother's pubes, until the finger tips rest upon the posterior lip of the external "os".

(c) If a Holmes' or Gerota packing tube is being used, with the obturator in position, after lubrication, pass the tip of the tube along the palm of the internal hand until the tip rests in the external "os." Withdraw the obturator and by means of the internal fingers keep the tip of the tube in position. Feed one end of the strip of packing material into the rod push the end of the strip of packing along the tube until it passes through the external "os." Continue to push the packing material along the tube until the cervix is filled and will hold no more.

Cut off the redundant tail of packing material and withdraw the tube while the internal fingers prevent any of the packing being pulled out of the cervix. A tail of packing material is thus left available in the vagina for ease of withdrawal.

(d) If long forceps are available pick up one end of the strip of packing material in the tips of the blades of the forceps. Introduce the tips of the blades of the forceps along the palm of the internal hand until the external "os" is passed. Deposit the end of the packing material in the cervix and use the blades of the forceps to feed more packing material into the cervix until it will hold no more. Cut off the redundant portion of the packing strip leaving a tail in the vagina for ease of withdrawal.

(e) If only fingers are available pick up one end of the strip of packing material in the tips of the fingers of the disengaged hand and by introducing these fingers along the palm of the internal hand pass up the end of the packing material until it can be gripped by the internal finger-tips. The internal finger tips must push the packing material through the external "os" until the cervix will hold no more. Finally cut off the redundant packing strip leaving a tail in the vagina for withdrawal.

(f) An alternative method is for the fingers, thoroughly lubricated with Lubefax, Paraffin or Glycerine, which are first introduced upto the external "os," to carry an end of the packing material with them. The other hand then feeds the packing material from the bowl to the vagina while the internal fingers push the packing material through the external "os" until the cervix is full. Cut off the redundant material leaving a tail in the vagina.

(g) Apply a large vulval pad, a "T"-bandage and an abdominal binder.

(h) Remove the packing by pulling on the tail in the vagina 18 to 24 hours.

(i) Willett's forceps if hæmorrhage becomes troublesome.

(j) Where after the membranes rupture delivery is delayed more than 24 hours. Apply Willett's or obstetric forceps according to the dilatation of the external "os."

IV. Packing or plugging the vagina and cervix (Tamponade).—

Indications :—Hæmorrhage due to threatened or incomplete abortion, placenta prævia, hæmatomata, abruptio-placentæ.

Dangers :—(a) Sepsis; (b) shock to prevent which Omnopon or Morphine must be given before the operation commences and, as the process is painful, an anæsthetic is desirable.

Special requirements :—(a) Six strips of gauze or other material 8 ft. by 8 inches folded four times lengthwise or about 200 small pieces of cotton wool made into little balls the size of a thumb knuckle. If this packing material has not been reliably autoclaved and stored in a sealed packet it must be boiled for 20 minutes in water to which a little 'Dettol,' 'Cyllin,' Lysol or Carbolic acid has been added or in a 1 in 1,000 solution of Proflavine or Acrillavine in water.

The inside of a mass of packing material takes longer to raise to the temperature of boiling water and much longer to cool than the fluid in which it is immersed.

(b) A sterile bowl to hold the packing material.

(c) It is of advantage but not essential to have a pair of plugging or ring forceps.

(d) Lubrication for the hand.

Operation :—Unruptured membranes are of great assistance in maintaining intra-uterine tension. An assistant must make counter pressure on the fundus uteri.

(a) Wring out the packing material if it has been boiled.

(b) After thorough lubrication, introduce one hand into the vagina, place the middle finger in the posterior fornix and the index and ring fingers each in a lateral fornix, the palmar surface may face the pubes or the sacral hollow.

(c) By means of a plugging forceps or by using the fingers of the external hand feed the packing material into the vagina and upto the fingers which are at the external "os." Commence with the end of one strip and when that is finished use a second strip. Beware of letting the packing material touch any unsterilized area or article.

(d) The internal fingers first fill up the cervix to capacity and then working round and round the fornices pack in the strips as tight as possible with the fingers pressing upwards all the time.

(e) When the fornices will hold no more gauze, work down the vagina from side to side packing in the material tightly and continually squeezing it upwards.

(f) The process is continued in a methodical manner right down to the vulva until the vagina can hold no more.

(g) A large vulval pad, a "T"-bandage and an abdominal binder must be applied on completion of the operation.

(h) Remove the packing 18 to 24 hours after it has been inserted.

HASTINGS TWEEDY'S METHOD :—"The left hand is passed into the vagina with the palm facing the hollow of the sacrum until the fingers lie behind the cervix. Small pieces of cotton wool, each the size of the thumb knuckle, are squeezed out in Lysol solution by the right hand and are conveyed to and inserted into and around the cervix. The fingers of the left hand are kept busy squeezing the pellets into a compact mass and forcing spaces between the pellets already in position to permit the insertion of still another pellet. This process is continued in a systematic manner from above downward till the vulva is reached and the vagina can hold no more. A T-bandage is then applied to keep the plug in position and an abdominal binder is

fastened tightly from above downwards to press the side walls of the uterus against the vaginal dam and thus complete the operation."

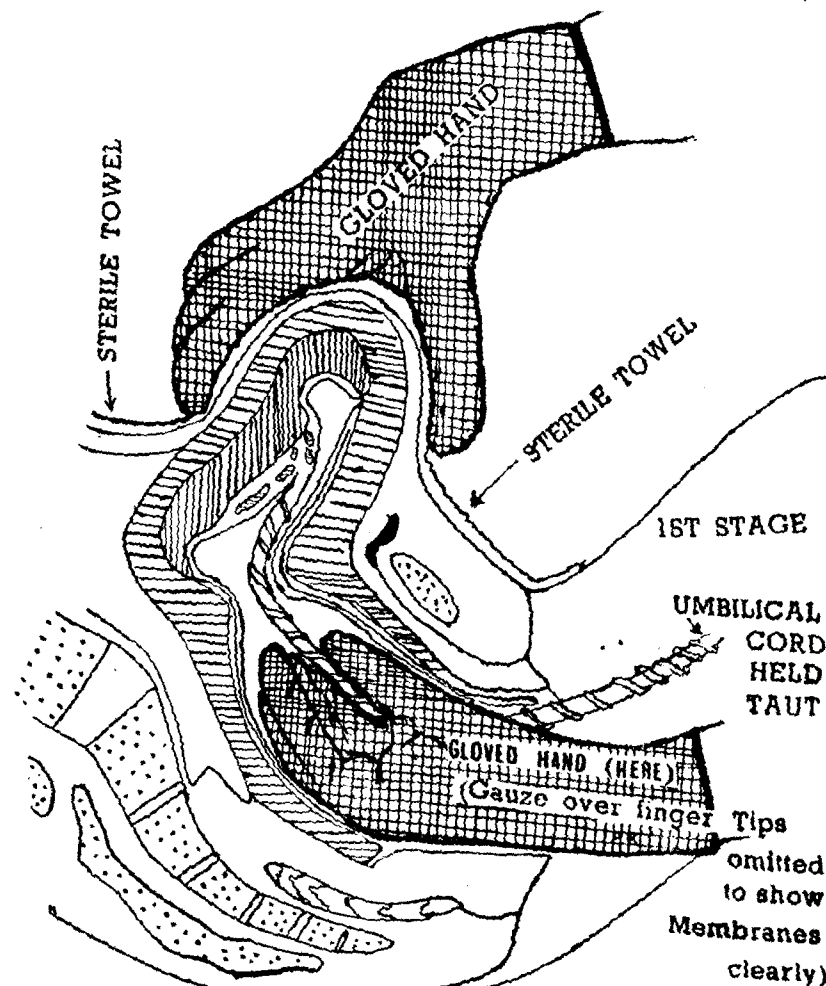
V. Injection of the umbilical vein: Majon-Gabaston Method.—

Indication:—In the absence of "P.P.H.", any long delay in the 2nd stage.

Special requirements:—(a) 200 to 300 c.c. (7 to 10 oz.) of warm sterile Normal Saline, 5% Glucose or Magnesium Sulphate solution; (b) a sterilized 20 c.c. syringe or Higginson's syringe and suitable adapter to fit a serum needle; (c) one or two sterile serum needles; (d) one or two sterile hæmostats; (e) stout sterile thread; (f) a sterile bowl for the liquid; (g) sterile swabs; and (h) Tincture of Iodine or other strong disinfectant.

The operation:—(a) Sterilise the cord for about 9 inches from the vulva by painting it with strong disinfectant; (b) tie off or clamp the free end of the cord; (c) by its prominent convolutions locate the vein on the surface of the cord; (d) fill the syringe with warm fluid; (e) introduce the needle into the vein parallel to the course of the vein with the point of

BIMANUAL REMOVAL OF THE PLACENTA IN CASE OF 'P.P.H.' OR



F. Allen
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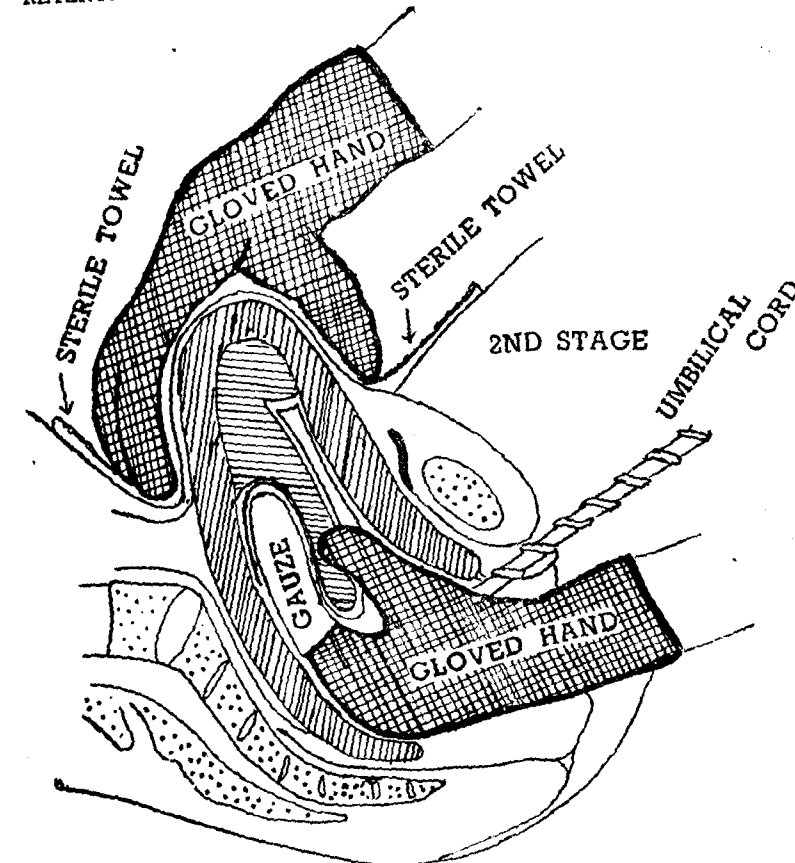
1st Stage.—Introduction of hand to dilate constriction and examine of uterus.

the needle towards the placenta; (f) apply a hæmostat or ligature around the vein including the shaft of the needle to hold them both firmly while the fluid is being injected and to maintain the needle in position when the syringe is being refilled; (g) inject the contents of the syringe through the needle; (h) disengage the nozzle of the syringe from the needle without disturbing the needle; (i) refill the syringe; (j) inject the second syringe-ful; (k) repeat the process until sufficient fluid has been injected; (l) withdraw the needle and clamp or tie the cord again above the puncture hole made by the needle to prevent leakage of fluid; (m) the placenta should be extruded in from 10 to 60 minutes.

VI. Bimanual compression of the uterus.—*Indications:*—Uterine hæmorrhage after the expulsion of the placenta provided the bleeding is not coming from a tear.

Separate the labia widely and introduce a hand into the vagina. When the whole hand is inside close the fist and push the knuckles up into

RETENTION FOR MORE THAN 24 HOURS.



F. Allen
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2nd Stage.—Separation of placental tissue from uterine wall.

ESSENTIAL FEATURES:—

1. External hand on fundus.
2. Cord held taut.
3. Gauze or sterile cloth over finger tips of internal hand.
4. Finger held in cone introduced along cord inside membranes.
5. Finger tips separate placenta pushing membranes between uterine wall and placental tissue.
6. The placenta must be removed in one piece and not fragmented.

the anterior fornix. Some people prefer to place the tip of the thumb in the anterior fornix and the finger tips around the posterior fornix.

Open the palm of the other hand and through the abdominal wall spread it over the posterior wall of the fundus of the uterus.

Squeeze the uterus between the abdominal, external hand and the internal vaginal hand and the symphysis pubis.

The elbow of the inside hand must be wedged against the bed or some fixed object to prevent it becoming tired.

If the external hand and arm become fatigued get an assistant to press on the hand.

If not already done and if available get an assistant to inject 5 oxytocic units of Posterior Lobe Pituitary extract and 0.5 mg. Ergometrine into a muscle preferably into the body of the uterus through the abdominal wall.

Instead of placing the closed fist in the anterior fornix, one may pass the whole of one hand into the cavity of the uterus, close the fist and massage the body of the uterus between the fist in the cavity and the hand on the abdomen. As the uterus contracts allow it to expel the internal hand slowly.

If bimanual compression fails to control the bleeding proceed to pack or hot douche the uterine cavity.

VII. Packing the uterine cavity. *Indications:*—P.P.H. after the placenta has been delivered, which fails to yield to 0.5 mg. Ergometrine and/or 5 to 10 oxytocic units of Posterior Lobe Pituitary extract injected into the uterine musculature combined with bimanual compression of the uterus.

Dangers:—(a) Sepsis. (b) Leaving behind some of the packing material. Therefore count the packs carefully during insertion and remove them all 18 to 24 hours or so later. Removal is effected by traction on the tapes, if any, attached to the packing lying in the vagina, or on the tails of the strips or by employing a pair of plugging or ring forceps. Thorough antiseptic technique is essential.

Special requirements:—(a) Six strips of material 8 yards long by 8 inches wide, each folded lengthwise four times upon itself. Usually about four or five such strips suffice to fill the uterus and vagina. Best of all is dry sterilized gauze, with a long tape attached. If this is not available gauze or strips of sari or puggari must be boiled up in 1 in 1,000 Proflavine or Acriflavine solution and wrung out. If Proflavine is not available 1% "Dettol" or "Cylin" or Lysol or 0.5% Carbolic Acid solution may be substituted or the strips boiled in plain water and wrung out.

(b) A large size 1 inch (2.5 cm.) bore Holmes' uterine packer or a pair of plugging forceps. If these are not available a hand alone may be used but the danger of sepsis will be greatly increased.

(c) A sterile container or bowl for holding the packing material.

(d) A bivalve speculum or two ring, bullet or vulsellum forceps and a posterior speculum.

Operations:—Usual preparation of patient and operator.

Patient in dorsal lithotomy posture with buttocks over end or side of bed or table. An assistant should hold the fundus.

A. 1. If no assistant is available the operator sits down with the container of packing material on his lap.

2. With one hand protected by a sterile towel he grasps the fundus through the abdominal wall.

3. With the other hand he carries one end of a strip of packing material on his finger tips through the vagina and cervix upto the fundus. If no tape is attached to the terminal end of the strip of packing material a tail of the strip should, if possible, be left in the vagina for ease of withdrawal and subsequent strips packed above this tail.

4. The internal hand then carries in more and more packing material (count the number of strips as each is inserted) upto the fundus and evenly packs the cavity from side to side and from above downwards. When one strip of packing material is finished another is taken into use leaving a tail of each in the vagina if possible. When the cavity is full to the cervix the internal hand steadily forces up the plug against the external hand and by thus compressing the plug makes room for more packing material, which must be fed in.

5. After the cavity of the uterus has been firmly packed the vagina must be packed and the packing kept in a position by a large pad, a "T" bandage and an abdominal binder.

B. 1. If an assistant is available but a packer or forceps are lacking the packing is done as above with the exception that the assistant holds the fundus and the operator's second hand is used to feed the packing material up to the internal hand, which is never entirely withdrawn until the entire uterine and vaginal cavities are tightly packed.

C. 1. If a plugging forceps, two ring, bullet or vulsellum forceps and a posterior speculum are available an assistant must press down the fundus while the operator by touch or sight applies the forceps to the lips of the cervix either both on the anterior lip or one on the anterior lip and one on the posterior lip.

2. The posterior speculum must be inserted and the cervix drawn down for inspection to see if any tear is causing the bleeding.

3. The operator must pick up the end of a piece of packing material in the jaws of the plugging forceps.

4. Pass the handles of the forceps which are holding the cervix to the assistant.

5. Depress the posterior speculum or introduce the index and middle fingers of a hand to serve as a posterior speculum.

6. Carry the end of the packing material on the tip of the forceps up to the fundus.

7. By placing the external hand protected by a sterile cloth on the abdomen estimate that the tip of the plugging forceps is really at the fundus.

8. Feed in the packing material and plug the uterine cavity evenly from side to side and from above downwards.

9. Leave a tape or tail end of each strip in the vagina if possible to facilitate subsequent withdrawal.

10. Count the number of strips as introduced.

11. When the cavity has been packed down to the cervix lay aside

the plugging forceps and with the internal fingers force the packing more tightly into the cavity thus making room for more packing below.

12. When the cavity of the uterus including the cervix is tightly plugged the vagina must also be firmly packed.

13. The whole packing is held in position by a large pad, a "T" bandage and an abdominal binder.

D. 1. If Holmes' Packer and a bivalve speculum are available introduce the speculum and examine the cervix for tears.

2. Through the speculum pass the tip of the tube of the packer with the obturator in position. Carry the tip of the packer tube right up to the fundus. The assistant holding the fundus through the abdominal wall must verify the height of the fundus against the distance the packer tube has entered or the operator must protect a hand by a sterile cloth and with it palpate the fundus from the abdomen of the patient.

3. Remove the obturator from the tube of the packer.

4. Introduce the end of a strip of packing material into the external end of the tube of the packer.

5. With the pronged packer rod feed the packing material through the tube up to the fundus.

6. Pack the fundus firmly from side to side and from above downwards.

7. When the cavity of the uterus is filled with packing material down to the cervix withdraw the packer.

8. With the tips of the index and middle fingers of one hand press the tampon tighter into the cavity of the uterus against counter pressure by the assistant on the fundus from outside.

9. Re-introduce the packer and continue to fill the cervix firmly and then the vagina.

10. When the tampon reaches to the vulva keep it in position by a large pad, a "T" bandage and an abdominal binder.

11. Count the number of strips unused and subtract this number from the original number of strips of packing material prepared. Write down the number of strips in the uterus and do not fail to remove every one of them 18 to 24 hours after insertion.

VIII. Hot intra-uterine douching at 118°F.—Indications:—"P.P.H.", after the placenta has been delivered, which does not yield to 0.5 mg. Ergometrine and/or 5 to 10 oxytocic units of Posterior Lobe Pituitary Extract injected into the uterine musculature combined with bimanual compression of the uterus.

Dangers:—(a) Introducing infection from the vulva and vagina; (b) air embolism; (c) forcing fluid along the dilated Fallopian tubes into the peritoneal cavity; (d) perforation of the uterus; and (e) poisoning from absorption of the active constituents of the douche fluid.

The hot fluid may cause the cervix or external "os" to contract strongly and thus prevent the return escape of the fluid into the vagina.

Special requirements:—(a) 4 to 8 pints (80 to 160 oz. 2,000 to 4,000 c.c.) of sterile normal saline, 2% "Dettol," "Cyllin" or 1 in 500 Carbolic Acid in water or 1 in 1,000 Proflavine or Acriflavine in water at a temperature

of 118°F.; (b) a sterile reservoir; (c) sterile jugs; (d) sterile rubber tubing; (e) a sterile return flow or channelled nozzle with large blunt end.

Operation:—(a) An assistant, if available, must hold the fundus of the uterus; (b) after douching out the vagina; (c) introduce the index and middle fingers of one hand up to the cervix; (d) with the douche fluid flowing guide the tip of the nozzle along the internal fingers and up to the fundus with great care and gentleness; (e) do not have the reservoir more than a foot or so above the level of the patient; (f) move the douche nozzle gently and carefully to and fro and from side to side in order to make the hot fluid impinge on all aspects of the internal surface of the uterus; (g) continue douching until the uterus is felt to harden up to a satisfactory contraction and bleeding ceases.

IX. Bimanual removal of the placenta.—Indications:—Urgent:—Violent "P.P.H." due to: (a) incomplete separation of the placenta; (b) to a constriction ring (Hour glass contraction) below the whole or partially separated placenta; (c) rupture of the uterus with escape of the placenta into the abdominal cavity or broad ligament.

At leisure:—Failure of the placenta to be extruded: (a) When there is slight but persistent "P.P.H."; (b) when the uterus has been ruptured; (c) after 24 hours or more of waiting.

Dangers:—(a) Shock; (b) infection; (c) perforation of the uterine wall by the operator's fingers; (d) inversion of the uterus.

Therefore, (a) Endeavour to give $\frac{1}{4}$ th or $\frac{1}{2}$ th grain of Omnopon or of Morphine "sub cute" or "sub lingua."

An anæsthetic, especially chloroform, will interfere to some extent with the contraction and retraction of the uterus after the operation and so should be avoided if possible, except in cases of a constriction ring, which is not dilatable by the fingers or overcome by inhalations of Amyl Nitrite or injection of 0.3 c.c. (5 mm.) of 1 in 1,000 solution of Adrenalin Chloride.

(b) In urgent cases there is not much time for sterilizing the vulva, vagina and the hands of the operator and yet no hæmorrhage is so dangerous that such preparations may be neglected. The vulva must be washed down with Ether or Methylated spirits if available followed by pure "Dettol," "Cyllin" or "Lysol" or 1 in 20 Carbolic Acid and care taken that the fluid does not run under the woman's buttocks, where it will burn her if she lies in it for more than a short while. Tincture of Iodine or "Dettol" obstetric cream may be rubbed into the skin. Even a good thick lather of common soap well rubbed into the skin and mucous surfaces and left to dry has considerable germicidal action as an emergency measure. When the vulva has been sterilized the vagina must receive similar treatment.

For this a 5% "Dettol" douche at low pressure followed by rubbing into all the crevices and interstices 30% "Dettol" in water, "Dettol" obstetric cream or Tincture of Iodine is satisfactory. The operator's hands, wrists and arms must be thoroughly washed in a thick lather of soap, a freshly boiled nail brush being used if available, for 5 minutes. In a grave emergency rinse the hands and arms in ether or methylated spirits and rub in "Dettol" or Tincture of Iodine especially around and under the nails. Another excellent disinfectant for rubbing into vulval skin and operator's hands and arms is a cream made of one part of Tropical

Bleaching Powder (Crude Calcium Hypochlorite) mixed thoroughly with two parts of water by weight.

When the operation is to be performed at leisure there is no excuse for failure to observe a full antiseptic ritual.

(c) In the case of extensive and firm adhesion great care is called for. It is better to leave small shreds of placental tissue attached to the uterine wall and to plug the cavity of the uterus with sterile packing material wrung out in some antiseptic such as a flavine, "Dettol" or weak Carbolic acid than to risk injuring the uterine wall.

KINKEAD was of opinion that inversion of the uterus followed partial detachment of the placenta. It is therefore imperative not to pull an adherent or partially adherent placenta off the wall of the uterus by traction on the cord or margin of the placenta. One must pass the tips of the semi-flexed fingers of the internal hand all round the margin of the placenta to ensure that there is no commencing inversion and only work the placenta off the uterine wall by insinuating the finger tips between the placenta and the wall. Any dimpling of the wall must be pressed out between the internal and external finger tips to prevent inversion taking place.

Operation :—(a) Lubricate one hand, wrist and arm with sterile soap, medicinal Paraffin, Glycerine or Lubefax and over the tips of the gloved fingers, if gloves are being worn, spread some sterile gauze or cloth which has also been lubricated.

(b) Place a sterile cloth on the patient's abdomen and through this grasp the fundus of the uterus with the unlubricated hand. Draw the fundus towards the pelvis.

(c) An assistant must hold the cord fairly taut but must *not* pull on it.

(d) Form the fingers of the lubricated hand into a cone and introduce the tips along the cord and *inside* the amniotic sac until the attachment of the cord to the placenta is reached.

(e) If a constriction ring is encountered the cone of fingers endeavours to dilate it against counter pressure from the external hand on the fundus. If this fails the assistant must break an ampoule containing from 1 to 3 minims of Amyl Nitrite under the patient's nose and make her inhale the Amyl Nitrite until the spasm is relaxed. Better still if the B. P. is low and sterile syringe is available, order an injection of 0.3 c.c. (5 minims) of 1 in 1,000 Adrenaline Chloride solution "I.M." to be given by the assistant. In the absence of Amyl Nitrite or Adrenaline profound anaesthesia with Chloroform must be induced. In cases which are not urgent the injection of 100 to 200 mg. of Pethidine Hydrochloride "I.M." may lead to relaxation of the constriction ring without the risks attendant on the administration of Amyl Nitrite, Adrenaline or Chloroform.

(f) Once the hand is inside the uterus it must *not* be withdrawn until the placenta has been extracted.

(g) With great gentleness, pushing the membranes in front of the tips of the internal fingers, the circumference of the placenta must be explored and the extent of the attachment, if any, discovered while the external hand steadies the fundus.

(h) (i) If there is no area of attachment and the placenta is free in

the cavity of the uterus it must be collected in the palm of the hand and withdrawn slowly as the uterus contracts down upon and expels the hand.

(ii) If it is found that the placenta is within the layers of the broad ligament it may be drawn back into the uterus and then withdrawn from the uterus *via* the vagina and if there is any hæmorrhage the rent in the uterine wall must be packed and the cavity of the uterus itself may require to be plugged. (In the absence of hæmorrhage, if a hospital is within reach, it would be safer to leave the placenta in the broad ligament and get the woman to hospital for laparotomy).

(iii) If it is clear that the placenta has escaped into the peritoneal cavity the placenta must be left where it is provided there is a possibility of getting the woman to hospital and that bleeding from the tear in the wall of the uterus can be controlled by packing. If this is impossible the placenta may be drawn into the uterus through the rent but a safer method, if the uterus is contracted, is to perform a posterior colpotomy and remove the placenta through the posterior fornix.

If the placenta is to be drawn into the uterus through the tear in the wall great care is required to avoid bringing coils of bowel or other abdominal organ into the uterus in mistake for or in addition to the placenta. If this accident should happen the placenta must be withdrawn *via* the vagina from the uterus, the hand reintroduced into the uterus, the abdominal viscera returned to the peritoneal cavity and the rent in the wall of the uterus plugged if it fails to contract sufficiently to prevent a recurrence of the prolapse of the abdominal viscus.

(iv) If it is found that the entire placenta or a portion of the placenta is adherent to the wall of the uterus the tips of the fingers of the operator pushing the membranes before them must carefully work from side to side between the placenta and the uterine wall to separate the two. The assistance of the external hand is required to steady the fundus and to ensure that there is no inversion or dimpling of the fundus into the cavity of the uterus. It is *not* difficult to bore through the uterine wall in some such cases, so *beware* of doing this and of withdrawing a loop of gut, omentum or other organ in addition to or in substitution for the placenta.

(i) Collect the placenta in the palm of the hand and, if possible, by massaging the uterus with the external hand, stimulate the uterus to expel the internal hand and placenta together in preference to dragging out the placenta.

(j) Examine the placenta. If it is not complete the hand must be re-introduced and cotyledons or succenturiate lobes removed.

(k) If owing to the risk of perforating the uterine wall a layer of placenta tissue has to be left adherent to the wall, the cavity of the uterus should be packed with sterile packing material for 18 to 24 hours.

(l) If bleeding continues 0.5 mg. of Ergometrine and/or 5 to 10 oxytocic units of Posterior Lobe Pituitary extract must be injected into the uterine muscle. If this fails to control the hæmorrhage the cavity of the uterus must be packed or douched with hot fluid at a temperature of 118°F.

(m) If there is a constriction ring which cannot be dilated remove

the placenta piecemeal by tearing off pieces with ring forceps provided you are unable to get the woman to hospital.

X. Hæmatoma of the vulva and the vagina.—Occasionally as a result of injury, or sometimes spontaneously, blood vessels, more commonly veins, in the pelvis, may burst during pregnancy, labour or post partum. The usual time for this accident is late in pregnancy or intrapartum. The effused blood forms a hæmatoma under the skin of the vulva, around the vagina, under the broad ligaments or in the broad ligaments. Such hæmatoma show a tendency to spread along the connective tissue spaces and may extend right round the vulva and vagina on all sides and even away back up behind the peritoneum. The victim may easily bleed to death in a serious case.

The onset is almost always sudden with a severe tearing pain in the affected part and a feeling later that it will burst. If the bleeding continues the woman will develop the signs of hæmorrhage (collapse, cold clammy sweat, thready rapid pulse, air hunger, blanching of the mucous membranes and later subnormal temperature, low blood pressure and unconsciousness).

If the hæmatoma should become infected extensive sloughing is the least of dangers to which the woman will be exposed.

A small hæmatoma may be treated by keeping the parts scrupulously clean and applying a cold evaporating antiseptic lotion. If ice is available it should be used. The woman must rest in bed. The effusion will usually absorb but if it becomes infected it must be opened, the purulent material let out and the cavity packed with finely powdered Sodium Sulphate.

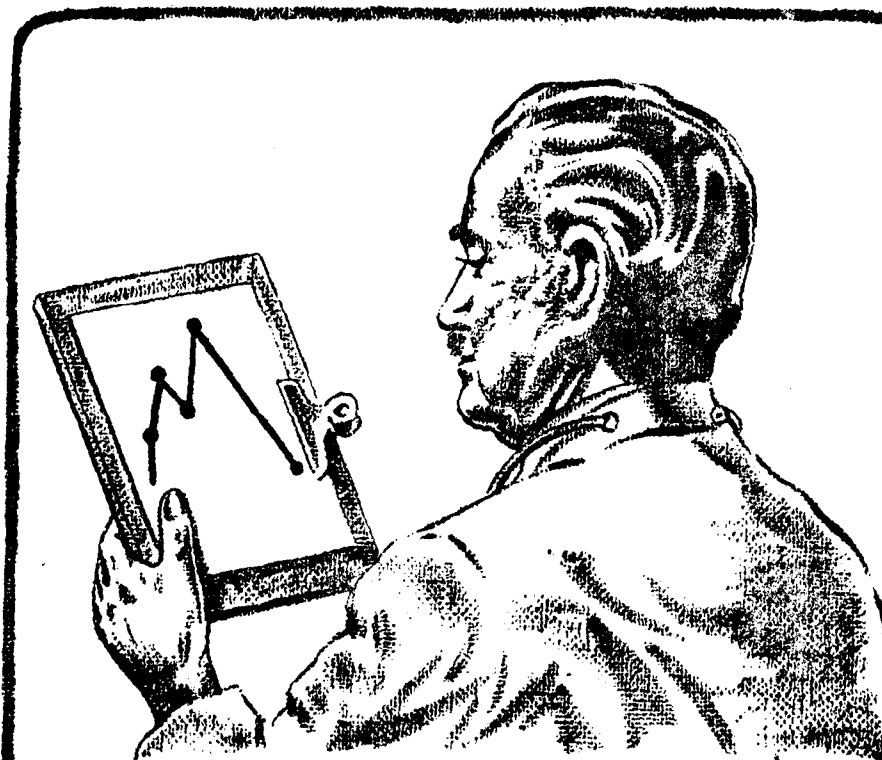
Larger hæmatomata may be aspirated provided thorough antiseptic precaution is observed and a firm antiseptic pressure packing applied to keep the site of the hæmorrhage compressed.

If aspiration and pressure packing fail or appear unsuitable the tumour must be incised, the fluid and clot mopped away with sterile cloth and the bleeding vessel caught in a hæmostat (artery or ring forceps) and ligated or undersewn. For this sterilised very fine (000) catgut, cotton or linen thread is suitable. If undersewing is required a round bodied needle should be used. A $\frac{1}{2}$ circle or $\frac{3}{4}$ circle needle facilitates the operation.

The whole utero-vaginal canal may require to be firmly tamponed by boiled clothes wrung out in "Dettol," Cyllin or weak Carbolic Acid solution. Finally a large pad and a "T" bandage must be applied to the perineum connected fore and aft to a tight abdominal binder.

In such cases it is advisable to give prophylactic tetanus antitoxin 1,500 units and Polyvalent Clostridia (gas-gangrene) antitoxin containing at least 9,000 units of Welchii antitoxin (Haffkine Institute, Parel, Bombay).

(To be continued).



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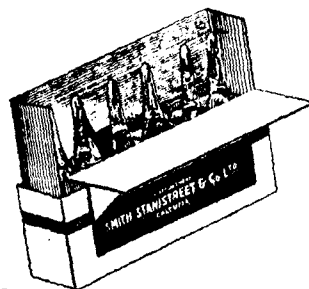
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Senescence as a Disease its Causes and Cure*

S. M. HUSSAIN, B.Sc., M.B., B.S.,
Canning Street, Lucknow.

Historical.—Senescence is a disease for which sages and philosophers of yore had been searching a remedy. It was mentioned by the Chinese long before the Christian era. The Cult of *Tao* was associated with the search for the Elixir of Life. In the dim past efforts at rejuvenation were made in India. "In ancient Hindustan, for instance, persons suffering from senile disability were given the testicles of a tiger to eat." The Arab medicine absorbed and improved on these ideas. The Muslim emperors and kings in their desire to remain young imported the most learned physicians of the day to look after their health and youth. It stimulated research and thus organotherapy came to occupy an important place in the Unani armamentarium. Among other things the use of testes received special attention. Europe received from the Arabs, as a heritage, the Unani medicine which flourished there for centuries. During the medical revolution in Europe the methods of rejuvenation together with other good and bad therapeutic measures were consigned to oblivion. From time to time, sporadically, it engaged the attention of the inquisitive minds. "First experiments on the transplantation of the testes were performed by John HUNTER in 1762 and by BERTHOLD in 1849." In 1889 CHARLES EDWARD BROWN SEQUARD injected himself with extracts from testes. "In 1911 and 1918 PEZARD proved again that, in cocks, transplanted testes were capable of maintaining the sexual characteristic of fowls." As time went on the idea of, and efforts at, rejuvenation became more and more intensified and a host of workers like STEINACH, HARMS, MARSHALL, LIPSCHUTS, SAND, SCHMIDT, BENJAMIN, HAIRE and others devoted themselves to research. This continuous effort of man to revive youth shows that the desire to live long and remain young is inherent in human nature. That gonads were intimately connected with senility and youth has been suspected from time immemorial, as the practice of castrating animals can be traced to the dim past. Hunting of animals for genitals is mentioned in *Hortus Sanitatis* a manuscript of the 15th century. "Ancient writings yield innumerable instances which present clear evidence that some of the effects of castration in animals and man were understood." Eunuchs as a class are mentioned to have existed among the Romans and Greeks and particularly in the harems of the Muslim kings. Eunuch is a Greek word meaning one who guards the couch. It was even then realised that eunuchs did not become impotent, and "Sultan AURAT III in the 16th century inaugurated the practice of amputation of the penis of the eunuchs in his harem." It was, however, during the last few decades that research established the profound influence of the gonads on ageing.

Introduction.—It is in the interest of the patient as well as the medical science to deal with old age as a disease instead of trying to treat the diseases of old age. SCHMIDT in this connection remarks: "A wide field for etiological treatment opens out when we come to consider the so-called diseases of old age. Their name is legion, and those who suffer from them form a majority at every clinic and in every doctor's consulting room. As soon as we have realised that these diseases are themselves

* Specially contributed to 'The Antiseptic.'

merely the symptoms of a single more general disease, the disease of growing old, what can seem more obvious than that we have to treat old age itself as a disease instead of treating the secondary diseases which are but symptoms of old age. The revolution in the thought and practice of a physician who has fully grasped this principle will be overwhelming. The attempt to deal with the symptoms of old age separately instead of dealing directly with old age itself is fatuous as would be the attempt to restore the colours of a faded leaf by painting it."

To treat old age as a disease and the so-called diseases of old age as mere symptoms may appear fantastic. An unprejudiced consideration of the various factors will however show the correctness of this view. Because its inevitable sequelæ is death and because everyone suffers from it, it cannot be put forward as reason enough to regard it as a natural phenomenon. There are pandemic diseases. Senility is characterised by its universality. There are a fortunate few who do escape it. Many a man is carried away before he is old. Is it not possible that youth may be prolonged to a ripe normal age and may then end with death? If such be the case senescence attacking a limited few will then be regarded as a disease.

If one becomes old at the age of say 30 or 40 we have no hesitation in labelling it as a disease. But having become used to seeing people of 50 or 60 becoming involved in senility we have come to look on it as a normal event. If these very people were to have a natural age of 65 or 70 and were only prematurely sent to the grave by senility it will be reasonable to regard it as a disease.

The problem of old age has been too intricate for human intellect to solve successfully. BROWN SEQUARD and STEINACH by their experiments and observations got some insight into the mystery of senility, and the success they achieved revolutionised medical thought and is a boon to the ageing man. Marvellous was the success in determining the origin of puberty and senility which the ancients had all along been suspecting but had never been able to prove. To discover the real culprit, the gonads, with or without accomplices like the pituitary, was no mean achievement. But alas the same puberty gland which endows human organism with adult activity and youthful energy in its turn suffers from decay. Reactivation of the puberty gland is really a palliative treatment of senility. Man has got to discover the cause or causes of and prevent the decay in the puberty gland itself. The advance made by modern medicine is however full of promise for the future.

Man has wrenched so many secrets from nature, e.g., electricity, magnetism, the use of sound waves in conveying messages, etc. He may, in future, be able to force the hand of nature to unravel, for his benefit, the mystery surrounding senility. No one can imagine to-day the success which may be achieved a 100 or 200 years hence. Constant failure to conquer old age has engendered in man a feeling of resignation and submission to what it has been to him inevitable. In view of his past failure he hesitates to call it a disease. But that actually he never treats it as normal and physiological is evident from his constant efforts to discover a successful treatment for it.

Symptomatology.—The advent of this disease is insidious. The changes which occur in all the organs and systems of the body are slow and at

no outset imperceptible. These changes can be viewed from two angles of vision.

1. As senility is thought to be inevitable it can be regarded as a normal event and as such the changes it produces as physiological. Only when a particular organ shows an unusual involvement over and above the average, special attention is directed to it and it receives a pathological name, e.g., cataract, arteriosclerosis, hyperpiesia, etc. The remedial measures applied are directed against these conditions (symptoms). They do not strike at the root cause—senility. Thus the treatment is only symptomatic.

2. From the view point adopted in this article the changes occurring in the body are the manifestations of a pathological entity—old age. The symptoms accompanying it are always pathological. The object of the treatment here is to apply some remedy, if possible, in order to eradicate the real cause—the senility. The treatment has therefore to be specific or curative and stress has also to be laid on prevention.

The symptoms are both physical and mental. It is unnecessary to describe them in any detail as they are thoroughly discussed in books under various diseases by which the symptoms of this disease are known. Briefly stated they are as follows:—

1. **OSSEOUS SYSTEM.**—Calcification and hardening of bones with increase in fragility and decrease in elasticity increase the liability to fractures.

2. **MUSCLES.**—Increase of the fibrous tissue at the cost of the muscles destroys agility and imparts sluggishness to all movements.

3. **VASCULAR SYSTEM.**—Sclerosis of the arteries leads to the hypertrophy of the heart and rise in blood pressure. The arteriosclerosis reduces the supply of blood to various parts of the body which thus can work only within certain limits. Human activity becomes circumscribed with ageing. The reduced blood supply also produces changes in the organs. The arteriosclerosis with raised pressure can be the cause of serious consequences, e.g., paralysis. The failure of the heart is not only the result of the fibrotic changes in the kidneys and sclerosis of the arteries but also of the fatty and degenerative changes in the heart muscle itself.

4. **RENAL SYSTEM.**—Increase of the fibrous tissue in the kidneys impairs its function, increases the work of the heart, and establishes a vicious circle which involves the heart, the kidneys, and the arteries. Failure of any of these is serious for health and life.

5. **DIGESTIVE SYSTEM.**—Shares the functional inertia which comes over the body as a whole. The decrease in the motility of the intestines causes constipation. The teeth fall out affecting the efficiency adversely. The system fails to supply the requisite amount of fuel to the body. The semi-inanition impairs the functional efficiency of the various organs of the body.

6. **THE GENERATIVE SYSTEM.**—The sexual activity decreases with age and ultimately disappears altogether.

7. **SPECIAL SENSES.**—The acuity of the senses diminishes. The eyes exhibit the manifestations of senility, e.g., cataract, presbyopia, arous, senilis, etc.

8. **NERVOUS SYSTEM.**—Old age influences this system both peripherally and centrally. The changes may be primary or secondary

the morbidity of the other organs, e.g., arteriosclerosis. The memory and the powers of concentration, initiation and decision begin to fail. The mental processes gradually become slow. The mind as a whole works at a low ebb.

9. OTHER SYSTEMS.—Share the changes occurring in other parts of the body.

10. GENERAL.—The hair turns grey, the skin hangs loose and wrinkled, and the body in general shows fatty and fibrotic changes. In addition to the loss of the intensity of thought and feeling, society, sex, life and surroundings have not as great an attraction for an old man as previously. There is greater desire to rest, doze, and sleep. An old person thus ceases to live. He merely exists.

Prognosis.—Due to the limitations in our knowledge the disease cannot be eradicated. The treatment of rejuvenation or reactivation can, to some extent, revive youthful activity of the mind and body. If human efforts to discover a specific remedy are crowned with success the prognosis will certainly become brighter.

Etiology.—The paramount influence of the ductless glands over ageing has long been recognised. The knowledge about the intimate relation of the endocrine system with youth and senility is no longer the monopoly of the scientists. BERNARD SHAW speaks of "the convenient regulation of health by pick-ups of hormone-stimulants, the blood being first carefully fortified against old age by gland products." If these ductless glands were to function nicely they have it in their power to defer or even banish old age. The maturity of the testes and ovaries coinciding with the attainment of adult life with its vigour and vitality and their decay after some 30 years synchronising with the climacteric naturally directed attention to their influence on ageing. Recent research has confirmed this view. Next to them the anterior pituitary, their activator, is of significance.

The endocrine system is a harmoniously and coordinately working entity. The puberty gland and the ant. pituitary have so far been proved to be concerned with the problem of ageing. But what influence the other component parts like thyroid and the adrenals exert, directly or indirectly, in inhibiting or stimulating senile processes, only future research will show.

That these glands individually and collectively are subject to exogenous and endogenous changes cannot be denied. They are not immune to the toxins of the infectious diseases, morbid chemistry and cytology of blood, nutritional abnormality, environmental changes, physical factors, etc. Thus all the influences surrounding man contribute, be it through the endocrines, to the advent of senility. BENJAMIN observes "much scientific study, much philosophical thought has been devoted to the blem of old age and death. But still many misconceptions and open questions exist as to their cause." The innumerable influences at work, apart from hereditary and congenital factors, from the cradle to the grave, make the etiology of old age complicated. Briefly they can be summarised as under:—

Emotional.—E.g., worry, anxiety, constant nervous strain.

Physical.—Lack of rest, over-activity, over-work with no and recreation, irregular habits.

Pathological.—Diseases impairing the functional activity of the body, e.g., syphilis, diabetes, etc.

Climatic.—E.g., the adverse influence of a tropical climate.

Dietetic.—Over-indulgence in food, harmful dishes, unbalanced diet.

Hereditary.—Inherited weaknesses, anatomical and physiological, inherited short span of life, tendency to disease, etc.

Economic.—Financial difficulties producing nervous strain, or causing under nourishment and even starvation.

Social.—Defective up-bringing, crooked mentality, repressions producing various complexes.

Sexual.—Complete inhibition causing atrophy, over-stimulation producing exhaustion, lack of adaptability to sexual life.

Environmental.—Maladjustment giving rise to various neuroses and psychoneuroses.

Modern Civilization.—Comprises many of the factors mentioned above. In the present age the changes are rapid requiring great powers of adaptability. The struggle for existence is keen and man has been alienated from nature and burns the candle at both ends.

Treatment.—Dr. HARRY BENJAMIN has remarked (in the reactivation of women): "It is a well-known fact, that the symptoms of old age vary greatly in various people, but also make their appearance at different times. These differences must be explained by two factors: First by the variety of injury, strain and abuse which make up an individual life. This factor justifies the adherence to the rules of proper living, which can never be emphasised enough. Secondly, by our endocrine constitution. The resistance that our glands are able to offer to the wear and tear of life determine the individual reaction to the wear and tear and that means the individual symptoms of old age. This is the factor which justifies the attempts of modern medicine to influence senility by strengthening the endocrine apparatus....." The first of these two factors is concerned with the prophylactic and the second with the specific treatment of old age.

Prophylactic treatment of old age.—It consists of all measures which are indispensable for the preservation of health. All the deleterious influences which have been mentioned under etiology have to be guarded against. In this connection the views expressed by the ancients are not without interest. The Salernitan faculty had laid down that the three best physicians were DOCTOR QUIET, DOCTOR DIET, and DOCTOR MERRYMAN. The principle underlying this dictum is applicable with greater force in the prophylaxis of senility. *Regimen Sanitas Salernitanum* translated by Professor ORDONAU in verse contains directions for deferring old age, and being of interest a few lines are reproduced here:

"If thou to health and vigour wouldst attain,
Shun weighty cares—all anger deem profane,
From hearty suppers and much wine abstain,
Nor trivial count it, after pompous fare,
To rise from table and to take the air,
Shun idle noonday slumber, nor delay,
The urgent calls of nature to obey,
These rules if thou wilt follow to the end,
Thy life to greater length thou mayst extend."

The Hebrews by instituting a 7th day of rest in every week have made the greatest hygienic regulation of all times and have thus emphasised the

importance of rest. Ill health is not compatible with the prolongation of youth. Perfect health alone can postpone senility.

Specific treatment of old age.—Regarding the existence and success of specific measures it will be of interest to quote SCHMIDT again. He remarks "RUZICKA in his study of tissue condensation, has given ample biochemical evidence that the process of senile condensation is reversible. WILHELM, by his microscopic study of the washing-out of pigmentary residues from the ganglion cells of the brain in rejuvenated animals, has demonstrated some of the mechanical results of this reversal of the process of condensation. But the most striking proof, a biological proof of reversibility, was provided by WIESNER's experiment, which is of such fundamental importance that I shall recapitulate. At another place he says: "It will henceforth be clear to all that attempts to rejuvenate have a serious scientific basis. There is no further doubt that the process of senility can be arrested and may even be reversed. The task of future investigators in this field will be, not to demonstrate the possibility of rejuvenation, but to perfect the therapeutic methods that shall relieve the disabilities of old age."

Once that old age has set in the only treatment possible is an attempt at rejuvenation or reactivation. As in the case of all specific therapeutic measures, success depends on early treatment. When the disease is far advanced with marked sclerotic changes chances of success are minimised. The principle of treatment is to stimulate or supplement the hormonal function of the gonads. The methods that become available can be only briefly referred to here:

I. Physio-therapeutic measures.—In 1920 STEINACH had suggested X-ray radiation to reactivate the functions of the ovaries and had carried out experiments jointly with HOZKNECHT and their results were encouraging. This was followed by the application of X-rays to the pituitary which is the starter of the gonads. Also first suggested by STEINACH artificial hypoxæmia has been used by the application of diathermy current to the ovaries, the pituitary, the thyroid, and the adrenals. The results of the electrical treatment have so far been uncertain.

II. Operative treatment.—It consists of: A. Vasoligature and Vasectomy; and B. Grafting of the testes and ovaries.

A. Vasoligature and vasectomy.—The testes have a dual function: one to manufacture the spermatozoa, and the other to manufacture the specific sex hormone or hormones. The ligature or section of the vas deferens causes the atrophy of the sperm-producing portion and the hypertrophy of the hormone-producing part of the testes. In 1911 STEINACH carried out experiment which extended hopes of the success of this procedure in human beings. The frustration of unreasonably high expectations, the conservatism of the human nature, and the distaste and difficulties attending all operative procedures have minimised its application and thrown it into disrepute. Judiciously applied in carefully selected cases it is of immense utility.

B. Grafting of the testes and ovaries.—STEINACH's researches set people thinking. A number of scientists devoted themselves to research in this field and observed the results of grafting portions of healthy testes and ovaries in animals and human beings. In 1913 VORONOFF tried

the experiments on animals. LICHTENSTERN attempted grafting on eunuchs and VORONOFF followed him in 1920 with his attempt at grafting the testes of apes on normal human beings suffering from senility.

In women transplantation of ovaries is the only operative procedure which is practicable. Some 30 years ago MORRIS of New York was the first to do the operation. Transplanted ovaries from animals do not become vascularised and generally are either absorbed or slough out. The ovaries of apes take longer to get absorbed and even VORONOFF combined it with the transplantation of other glands. Homio transplantation is not practicable for obvious reasons.

These operations bring about relief from the symptoms of senescence and a general improvement of health and vitality. The difficulties accompanying all operative procedures and the uncertainty about the results have not made them popular.

III. Hormone Therapy.—It has to a great extent replaced transplantation and is the easiest and more successful therapeutic measure to-day. BROWN SEQUARD was the first not only to carry out researches about the male hormone but also to use it on himself and others in an endeavour to establish rejuvenation. The difficulty of preparing the hormone in a pure and effective form has been to a great extent solved by the labours of a host of experimenters in the field. The preparation of sex hormones has proceeded rapidly from the testes, then from the pregnant urine and lastly it has been produced artificially. In spite of the marvellous advance made in this direction the last word has not been said about the sex hormones.

The pituitary and the thyroid having intimate relationship with the gonads are, in selected cases, included in hormone therapy. The endocrine study of each case is necessary so that the deficient gland or glands may be included in the gonadal therapy. It has been hinted that there is still much to be learnt about the endocrine system. Future may throw greater amount of light on the intricate and complicated working of the ductless glands enabling more intelligent and more effective application of their hormones for the relief from the disabilities of old age.

Conclusion.—The different lines of treatment indicated above have all their limitations. None can be said to be perfect. The success achieved in recent years is however encouraging and the future is full of promise. A time may come when death may be indefinitely postponed and man may always remain young dying before becoming old. It is only a supposed possibility to-day which may become practicable tomorrow if man succeeds in forcing the hand of nature to reveal one more of its secrets for his benefit.

Deficiency of Endocrine Glands*

D. N. DEBSARMA,

A.M.O., Bhelaguri P. E., (K. D. H. P. Co. Ltd.), P. O. Nakachari, Assam.

TO-DAY there is hardly any necessity to stress upon the fact that the endocrine glands are intimately connected with beauty, youth, vitality, vigour and longevity of man, maintenance of which entirely depends upon the efficiency of the endocrine organs, or, in other words, health and life of man are quite dependant upon the normal activities of these mysterious organs. The ancient healers of various countries like India, China, Greece and Italy used different parts and glands of animals as medicines in the treatment of human ailments though they used them blindly. Even to-day in India as well as in China the Ojhas (exorcists) use some parts of animals and birds such as the testis of ram, the lungs and the liver of a hog, bile of an ox, dried brain of the fetus of a hind, fat of Dhanesh (a kind of bird), dried brain stomach and intestines of the porcupine, flesh of the black-cock and dried placenta of animals. Various preparations of these things are used both externally and internally in many diseases. For instance, preparations of dried placenta are administered in delayed labour. But the modern medical science has advanced much in the knowledge of these glands, the characters and functions of which were not clearly understood by the ancient physicians. Many distinguished doctors like Dr. ADDISON, Dr. MERING and Dr. MINKOWSKI have discovered a great number of useful things in the field of endocrinology during a great century. In 1849, Dr. BERTHOLD proved the existence of internal secretion in the human body. He also showed that the internal secretion of the testis is entirely responsible for the growth of secondary sex characters in man. He observed in his experiments the disappearance of these sex characters in male animals after removal of the testis and their reappearance after transplantation of the same. Dr. BROWN SEQUARD showed that an animal will soon die of Addison's disease after removal of its suprarenal glands. Dr. SCHIFF observed myxœdema in a dog after removal of its thyroid gland. In 1889, Drs. MERING and MINKOWSKI found sugar in urine of an animal whose pancreas was cut off. In 1892 Dr. EISELBERG proved that tetany will result from the removal of the parathyroids. Dr. HENBNER observed the influence of the removal of the upon the growth of the body especially of the genital organs. Dr. NICHOLAS PAULASOS of Bukharest was able to remove the pituitary gland and he found that death was the rule after its removal (Dr. S. K. MUKHERJEE'S Endocrinology). All these show that every one of these organs takes an active part in the maintenance of human life. They all act in harmony and they are closely inter-related and, therefore, diseases in others, the resulting clinical picture depending on the resultant of various factors (Lt. Col. E. J. O'MEARA). The endocrine glands bear a close relation also to the nervous system. The autonomous nerves regulate the amount of secretions of the glands according to the necessity of the body, and also the activity of these nerves depends in many cases upon their stimulation caused by the hormones. For example, when the sympathetic nerves are excited thyroxine is secreted, and this thyroxine again, in its turn, stimulates the sympathetic nerves. So, when this balance is disturbed, various diseases may occur.

* A paper read before the XX All-India Medical Conference held at Ahmedabad in the last week of December, 1943, and specially sent for publication to 'The Antiseptic.'

Now, before I discuss the ailments that may occur as a result of deficiency of the glands in question, I think the functions of these bodies should be considered first in order to make these ailments more apprehensive. Only those organs whose actions have been hitherto understood by experiments are mentioned below:

I. Thyroid gland.—(a) It is an energy-producing gland. It brings about the growth of the body and helps in increasing the activity of certain cells of the eyes, skin, hair, nail, teeth etc.; (b) Its active principle, thyroxin has also anti-toxic properties and insures resistance against micro-organisms. [R. KNOWLES and B. M. DAS GUPTA have shown that the thyroid increases the resistance of the body against trypanosomiasis, a protozoal infection—*Far Eastern Association of Tropical Medicine, Transactions of the 7th Congress*, Vol. II, 1927]; (c) It also regulates the mental activity, the body temperature and the respiratory process.

II. Parathyroids.—(a) Parathormone, the internal secretion of these small glands, maintains the normal level of blood calcium; (b) It neutralises guainidin, a urea like metabolic toxin, which causes tetany by stimulating the nerve endings; (c) It ensures co-ordinate and stable action of the nervous-system.

III. Testis.—(a) The active principle of the interstitial cells of Leydig plays the principal part in the development of sex characters; (b) The testicular hormone also helps in calcium metabolism; (c) It develops the mental faculties such as intellect and courage; [(d) It plays some part in the regulation of the B. Pr. too—*Antiseptic*, Dec. 1943, p. 675].

IV. Ovary.—(a) The secretion of the interstitial cells of the ovary is responsible for the growth of the generative organs and the sex characters in females; (b) Activity of the female genital apparatus depends upon the proper function of the internal secretion of this gland.

V. Corpus luteum.—(a) The corpus luteum hormone keeps the menstruation in abeyance, gives the fertilized ovum a chance of growth in the uterus and thus helps in the process of conception; (b) According to HURST it has also the property of neutralizing toxins of the body.

VI. Placenta.—(a) The internal secretion of the placenta controls the contractility of the uterus during pregnancy; (b) Dr. BANDLER says that this chemical messenger controls the activity of the ovary and so menstruation cannot occur during pregnancy.

VII. Mammary glands.—(a) Some research workers suppose that also these glands produce some hormone and also presume that this substance prevents conception during lactation in some unintelligible way.

VIII. Pituitary body.—(a) The anterior portion of the hypophysis cerebri is responsible for the growth of the skeleton and sex organs. "The anterior pituitary hormone causes the appearance of the Graafian follicle, its growth, its rupture and its luteal changes."—*Midwifery* by GREEN-ARMYTAGH and P. C. DUTT, 2nd edition, p. 11. "It also stimulates thyroid function, sex organs, the breast, and the cortex of the adrenals." (*Majumdar's Pharmacology*, p. 353); (b) The internal secretion of the posterior lobe of the gland maintains the tone of the tissues and all contracting organs such as the uterus, the bladder, the intestines,

the stomach and the heart: (c) Pituitary maintains the normal blood pressure.

IX. Suprarenal glands. (a) They act as a storehouse for energy of the sympathetic system and buck up the whole system into activity; (b) Eucortone, the active principle of the cortex of the gland, regulates the growth of the muscles and gonads and also regulates the metabolism of cholesterol and sodium. It has a detoxicating property also; (c) Adrenalin, the active principle of the suprarenal medulla, maintains the muscular and vascular tone, increases the activity of the kidneys and favours glycogenolysis (*Majumdar's Bed-Side Medicine*, 4th edn. p. 554).

X. Pineal gland. (a) During childhood and adolescence the secretion of this gland like that of the thymus stimulates the growth of the body (*S. K. Mukherjee's Endocrinology*).

XI. Thymus. (a) It helps in calcium metabolism and develops the central nervous system and the sexual organs; (b) It is also said to possess some antitoxic property.

XII. Pancreas.—(a) It helps in the process of digestion. Insulin, the secretion of the B-cells of the Islets of Langerhans, turns blood sugar (Glucose) into energy. In diabetes mellitus the power of utilizing sugar is lost. This power is restored by Insulin.

XIII. Duodenum. (a) Pro-secrein is the internal secretion of the duodenum. It stimulates the pancreas to produce digestive juice.

XIV. Prostate gland. Some authors believe that this gland also has some internal secretion and it exerts some influence upon the nervous system.

XV. The liver and the stomach.—These are responsible for the production of hemopoietic hormone, lack of which gives rise to severe anaemia. The mucous membrane of the stomach secretes an enzyme-like thermolabile substance which acts on proteins and forms a hormone. This hormone is essential for the maturation of the R. B. C. (CASTLE). It is absorbed from the intestine, stored in the liver and carried to the bone-marrow when required. (*Majumdar's Pharmacology*, 5th edn., p. 362).

Besides these the spleen and the kidneys are also supposed to have some internal secretion though no sufficient proof is available for this speculation.

Now the functions of the endocrine glands are so numerous and their responsibility for the process of life is so great that any deficiency in their work is almost always followed by some anomalies of the system. Let us see what are the possible causes of this deficiency and what are the principal ailments that may result from it. We shall only touch upon the points as a full discussion of all these points is not possible here in this short paper.

The causes comprise the following:—

1. **Total absence of glands:**—Glands like the testis and the ovary may sometimes be absent. Such cases are on record (*S. K. Mukherjee*).
2. **Defective growth of the glands:**—Cretins and idiots are the results of this abnormality.

3. **Degeneration of gland structures due to some bad diseases.**
4. **Removal of a certain gland during an operation.**

5. **Defective diet:**—For example, the thyroid cannot produce a sufficient quantity of Thyroxin if an adequate quantity of protein is not present in the foods. In the same way vitamins and minerals are also indispensable for an efficient work of the glands.

6. **Injudicious use of certain drugs:**—Ergot and Insulin decrease the efficiency of thyroid (*S. K. Mukherjee*).

7. **Disorder of the nervous system:**—Some glands like the suprarenals and the thyroid work well only when the para-sympathetic system is in order.

8. **Period of life:**—During old age the endocrines excepting the suprarenal glands become sluggish in their work. After puberty and during pregnancy they temporarily suffer from inequilibrium of their activity.

9. **Race:**—According to Dr. S. K. Mukherjee the thyroid and the pituitary glands do not develop well during the youth of the Bengalees. Jews seem especially prone to diabetes (*K. N. Murthi*). Probably the Islets of Langerhans are not properly developed in them.

10. **Sex:**—The Indian females of the middle classes suffer more than the males from goitre on account of their nervous instability. (*Antiseptic*—Sept. '43, p. 472).

As already stated the abnormalities that occur as a result of hyposecretion of the endocrine glands are numerous. Some may be called minor and the others major. The minor maladies such as migraine, weakness of the heart, delayed puberty in female, etc., in thyroid deficiency, and obesity, slow pulse, weakness of the intestinal muscles, etc., in pituitary deficiency are often overlooked. Only the major ones draw due attention of both the patient and the physician and require treatment. Only the names of a few important diseases are mentioned below:—

Hypo-thyroidism—toxæmia of pregnancy (eclampsia, hyperemesis gravidarum, etc.), stuporous melancholia, myxœdema, cretinism, etc.

Parathyroid deficiency—pyorrhœa alveolaris, sprue, colitis, chronic rheumatism, psoriasis (calcium metabolism disturbance), tetany (Guaiadinin poisoning), etc.

[Hypofunction of the thyroid and the parathyroid glands is associated with low B. P. (*Antiseptic*, Mar. '44, p. 136)].

Hyposecretion of hypophysis cerebri—Frohlich's syndrome (Ant. pituitary), obesity, subnormal temperature, intestinal paresis (post pituitary), etc.

Hypo-adrenia—Addison's disease, etc.

Deficiency of the gonads—non-development of sex-organs, and absence of sex characters, infantile uterus (hypo-ovarium), etc.

[The result of the dysfunction or hypofunction of the gonads is the increase of the fibrous tissues in the organs of the body (including arteries), and this leads to arteriosclerosis and hypertension especially in old age. (*Antiseptic*, Dec. '43, p. 677)].

Pancreas deficiency—diabetes (Insulin inadequacy).

[Some authors believe that its deficiency can cause a permanent type of hypertension too—*Antiseptic*, Mar. '44, p. 136].

Duodenum deficiency—atonic dyspepsia (want of pro-secretine), etc.

Hypothyroidism—malformation of bones, unnatural growth of the genital organs.

Pineal deficiency—precocious growth of the genital organs, mal-development of the body and defective growth of the brain cells.

Prostatic deficiency—some eminent doctors affirm that the prostate gland is generally found enlarged in patients of mental disorder. It swells probably to produce more fluid (its secretion) to make up the deficiency.

Lack of hæmopoietic principle (liver and stomach)—macrocytic (per-nicious) anæmia develops when this principle is not adequately produced by the liver and the stomach (*Majumdar's Pharmacology*, 5th edn., p. 282).

The gastric mucosa secretes another hormone which is responsible to some extent for the intestinal movements. Chronic constipation, and sluggishness of the movements of the intestines may develop due to its deficiency. (*Physiology* by A. Randle Short).

Then as regards the treatment of the said ailments I wish to give here only the outlines of it as the scope of this article does not allow me to deal with it in detail. For the sake of convenience the treatment may be outlined under the following three heads:

(1) General treatment; (2) medicinal treatment; and (3) surgical treatment.

General treatment.—This comprises mainly rest and regulation of diet. Perfect rest to both the body and the mind is essential in many conditions like nervous debility and palpitation of the heart in hypoadrenia, and weak pulse and general debility due to impaired digestion in hypoadrenia. The diet should be nutritious and readily digestible. The food articles should be rich in vitamins and other organic and inorganic constituents necessary for the sanity of the endocrine system. Proteins in the forms of milk, meat, fish, etc., form the main part of diet in cases of hypoadrenia and hypothyroidism. Iodine is also indispensable for the production of thyroxin. So the foods must contain iodine in cases of thyroid deficiency. In this way diet should be carefully selected in every case.

Medicinal treatment.—This may again be divided into two parts: (1) organotherapy; and (2) the symptomatic.

1. *Organotherapy* is applied for the following purposes:

(a) To help a diseased or deficient gland in its activity. [For example, testicular hormone is administered to recompense the hypofunction of the testis].

(b) To have some particular effect of a particular gland product in conditions other than the endocrine disorders, e.g., the application of Post-Pituitary Ext. in uterine inertia and intestinal paresis and oestrin therapy in involutional psychosis—*B.M.J.*

(c) To control hyper activity of a certain gland by administering a gland preparation or an isolated hormone having opposite properties. For

instance, thymus can regulate the function of the thyroid gland. In this connection I should state that a hormone may do more harm than good unless it is used judiciously. Proper selection of a gland extract for an ailment requires careful observation of its signs and symptoms. The gland or glands at fault should be found out first by clinical examinations and then treated accordingly.

2. *Symptomatic treatment*.—Besides the specific treatment (organotherapy) symptomatic measures are also necessary for some associated conditions. For example, Pot. Bromide and Chloral Hydrate are advantageously administered in muscular spasms of tetany of parathyroid deficiency.

Surgical treatment.—This form of treatment includes (a) removal of an enlarged gland (e.g., the thyroid gland when enormously enlarged); (b) ligature of the vas deferens (Steinach's operation); and (c) transplantation of testis. In cases of pineal tumour no surgical treatment is possible. In such cases radium treatment is said to have some beneficial effect. Surgical interference becomes imperative in some associated conditions too. Appendicitis, tonsillitis, etc., that may occur as a result of disturbed calcium metabolism in parathyroid deficiency may require surgeon's help. In conclusion I want to add that detection and correction of the deficient gland, or, in other words, removal of the cause should be the main aim in the management of all maladies of this class.

Apology and acknowledgment.—I have ventured to briefly review this very important and difficult subject in the hope that this humble paper may stimulate further work on the subject although my own experience is quite inadequate in the matter. I hope members of the profession will co-operate and add their own quota in unravelling the mysteries of the endocrines to which man, the wisest in creation, is a mere slave. In the end, I must express my indebtedness to the authorities whose works have been consulted by me in the compilation of this paper.

Note.—The words enclosed in the brackets, [. . .] have been added after the paper was read in the conference.

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Atypical forms of Ascariasis Lumbricades

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ROUND worm infection is a common disease in the villages. It has a marked deteriorating effect on the growing children. Round worm cases sometimes come as emergency cases and then one has to diagnose and tackle the case as early and as promptly as possible or else the life of the patient is at stake. For such cases in villages where no laboratory facilities are at hand one has to diagnose by the exclusion method only. The following are some of the cases:—

I. A girl, aged 10 years, attended the out-patient dept. for a movable mass in the abdomen on the right side of the umbilicus.

Inspection:—The mass was of the size of a big orange slightly alleviated from the abdominal wall.

Palpation:—The mass was soft and can be moved up and down freely. It was not adherent either to the abdominal wall or with the internal organs.

History.—The child used to feel drowsy and weak. Tongue was coated. Loss of appetite and slight anæmia. She was having temperature 99°F., pulse 90 p.m. at that moment. Considering the soft temperature swelling and the condition of the patient and her age it struck me that it might be a case of ascariasis.

The following prescription was given:

Santonin gr. 2; Calomel gr. $\frac{1}{4}$; Soda Bicarbonate gr. 15.
Mft. one powder before going to bed.

Magsulph $\mathfrak{z}$ i twice in the morning with warm water. The result was that nearly 100 round worms were expelled out. The girl was relieved of the mass and is healthy now. The swelling was due to coiling up of the worms into a mass.

II. A boy, aged 4 years, attended the out-patient dept. for fever with cough since one month. The relatives complained that the child was very much run down since then.

Inspection:—The child was very weak and anæmic. There was foul breath from the mouth, tongue coated, abdomen distended and prominent.

Palpation:—The abdomen was somewhat hard and tympanic, liver slightly enlarged, spleen enlarged and two fingers below the left costal margin.

Ascultation:—There were rhonch and rales in both the lungs with bronchial breathing. But the sputum was slight and frothy.

Temperature 100°F., pulse. 105 p.m., respiration 25 p.m. The attendants gave some vague history of fever and rigors also.

Treatment.—My first line of treatment was for malaria. Quinine Bi Hydrochlor (1 c.c. 5 grs.) was given intramuscularly.

R Quinine Sulp gr. 8; Acid Hydrochloric dil m. 8; Aqua $\mathfrak{z}$ iss; $\mathfrak{z}$ ss t.d.
This was given for 3 days. No remission.

Then I suspected the case to be chronic bronchitis. So I gave M & B 693 $\frac{1}{2}$ tablet t.d.s. and mixture Expectorant $\mathfrak{z}$ iss for 3 days. No relief. The

[724]



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condition of the patient was going down day by day. But after 2 days the child passed one dead round worm. This might be the effect of M & B 693. Santonin in powder form was given. Nearly 5 to 6 dead worms were passed. The signs of bronchitis disappeared and the child improved within a few days.

III. I was called upon at 2 a.m. in the night to see a boy, aged 5 years, for persistent vomiting of watery fluid. The child was having diarrhoea also since two days. The child was slightly dehydrated and somewhat delirious. Temperature 102°F., pulse 120 p.m. Weak. There were signs of bronchitis in the lungs. The child could not retain a spoonful of fluid.

R Corre Oxalas gr. 5; Acid Hydrochloric dil m. 2 t.d.s.; Mist. Bis carb.
3iss t.d.s. This mixture was given.

Vomiting stopped for the present. Glucose and Saline were given per rectum for dehydration. But the next day vomiting and diarrhoea again followed. The child began to put fingers in his mouth. The attendants saw one round worm in the throat. Before I arrived it had gone down. Stomach tube was passed to push the worm into the stomach. S. W. enema was given. Two dead round worms with plenty of oxyuris vermicularis were passed. The next day another S. W. enema was given. More worms were passed. This was a case of double infection. Hypertonic Saline was given for oxyuris vermicularis. Santonin was not given considering the weak condition of the patient. Though the child has improved it is not yet healthy. Later Santonin has to be given.

Naga Sore

J. C. BAGCHI,

Medical Officer, Durgaganj P.O. Purnea District.

SINCE 1923 I have been serving here and have not seen Naga Sore. Recently 6 cases were treated by me and I have been successful in curing them by the following simple process. Sores were seen on the leg and they were marginated and full of profuse pus. Out of 6 cases only two cases took a long period to heal up. I am writing the simple routine treatment which, I think, will help my fellow brethren.

1st case.—Babu Jyothish Chandra Sinha of Chandpur, aged 40, Hindu, male. One day one pimple was seen on the right leg. Then it began to grow up with burning sensation and excruciating pain. From the history of the case, I came to know that after the 4th day the ulcer was marginated and full of pus. I saw this gentleman after 7 days when he was bedridden.

Treatment.—1. Saline purgative was given.

2. After cleaning the sore I touched Acid Carbolic liq.

3. I advised him to wash the parts with E. C. three times a day and Boric ointment to be applied and bandaged.

4. I injected Urea Sulfazide 5% in 2 c.c. intramuscularly. On the third day I was again called in to see him and I saw there was no improvement. I injected the same medicine and advised him to take Urea Sulfazide tab. (Union Drug Co.) one tab. at a time, 4 times a day. It did much good, but it took a long time to heal up. The gentleman was a poor man, so he could not buy other medicines.

2nd case.—Babu Bholanath Das of Chandpur, Hindu, male, aged 35. His sore was of the same nature. Urea Sulfazide 2 c.c. was injected on every third day. Sulfanilamide (Squibb's) 5 grs. tab. was prescribed for him to be taken one tab. at a time twice daily and he was advised to sprinkle the Sulfanilamide tab. after powdering finely on the ulcer and bandage. By this routine treatment all the cases were cured.

One of my patients was very poor and he was suffering from kala-azar. This man got an ulcer of the same nature. He attended the dispensary for taking injection and simple ointment. It is strange to note that I gave the man 8 injections of Urea Stibamine (Brahmachari) and he was fully cured. Here I am in confusion whether Urea Stibamine (Brahmachari) will do good in Naga Sore or not. If so, my fellow brethren will let me know through the "Antiseptic."

An Interesting Case of a Foreign Body in the Vagina

G. RAGHAVACHARYULU, M.B., B.S.,
Ongole.

A FEMALE patient, aged about 52 years, was brought to my clinic last year for treatment of profuse hæmorrhage per vagina. The history given by the patient and her attendants was rather vague but I could elicit that the hæmorrhage was only of recent origin, i.e., of about 12 hours duration. The patient was an ill-nourished anæmic old woman with a pulse rate of 100 P. M. and of low volume and tension.

Suspecting that it might be a case of advanced carcinoma of the cervix, I put her on the table with the idea of making a vaginal examination. But to my surprise I found a hard rounded object filling the whole vaginal cavity, where clots of blood were also accumulated. On close enquiry the patient revealed that she introduced a bau fruit an year ago with the object of retaining her prolapsed uterus inside. When I tried to remove the foreign body with the fingers I found it absolutely impossible.

Then I anæsthetised the patient and after cleaning the parts applied an obstetric forceps and delivered the foreign body with some difficulty. It was of the size of a small foetal head and the surface of the bau fruit was covered with some white deposit. After the vagina was douched with a hot astringent lotion it was found that the vaginal walls and the cervix were extensively ulcerated and bleeding. The vagina was plugged with sterile gauze soaked in Glycerine and Sulfonamide and the patient put to bed. After treatment for 15 days, by regular douching and dressings, the ulcers were healed and the patient regained her health. Even after the patient got up from bed and began to walk about her procedentia never reappeared.

The interesting points about this case are:—(1) The unusual size and nature of the foreign body. (2) The patient could introduce by herself and retain such a big object for well over an year without much discomfort. (3) This foreign body seems to have effectively prevented the prolapse of the uterus and probably given her a spontaneous cure without an operation.

Use of Epsom Salt in Injuries, Ulcers and other Sepsis

D. B. BOLE, L.C.P.S. (Bom.),
Ex-S.M.S.O., S.A.S., M.C., Erigavo Hospital, Erigavo, Br. Somaliland, via Aden.

Hadiyo Warsama, a Somali female of H. T. tribe, rather tall, thin and weak, aged about 23, was brought to me at 12-30 p.m. on 14-10-'43. on a camel by her husband, for treatment of the following injuries caused by a sharp instrument by his first wife, at about 7-0 a.m. that day.

- (1) I. W. $1\frac{1}{2}$ " x $\frac{1}{4}$ " x exposing about 5" of mesentery out, below left lower ribs, front external side.
- (2) I. W. $4\frac{1}{2}$ " x $\frac{3}{4}$ " x $2\frac{1}{4}$ " deep, outer side right shoulder.
- (3) I. W. $1\frac{1}{2}$ " x $\frac{1}{8}$ " x bone deep, back part of right parietal bone.
- (4) I. W. $2\frac{1}{2}$ " x $\frac{1}{4}$ " x muscle deep, right outer side chest, mid third.
- (5) I. W. $1\frac{1}{2}$ " x $\frac{1}{2}$ " x $\frac{3}{4}$ " right front shoulder fold.
- (6) I. W. $1\frac{1}{2}$ " x $\frac{1}{2}$ " x $\frac{3}{4}$ " left side back, lower third.
- (7) I. W. 1" x $\frac{1}{8}$ " x muscle deep, metacarpal of rt. index finger back.
- (8) I. W. $\frac{1}{4}$ " x $\frac{1}{8}$ " x skin deep, right thumb, back, against No. 7.

I cleaned all injuries with spirit, fomented the mesentery, replaced it inside, sutured Nos. 1 to 6, covered them all with gauze dipped in Acriflavine solution and dressed them.

Next day I dressed all the injuries as above. There were no signs of sepsis. However her temperature was 99.4° which I took as the reaction of injuries. She was feeling comfortable. The third day there were signs of sepsis. Due to acute shortage of drugs owing to war circumstances I had no Sulphanilamide group of drugs. Even the ordinary treatment was not to my satisfaction. On the fourth day there was much discharge from almost all wounds, and I had to remove some stitches from Nos. 1 and 2. Though I had kept her bowels open she had retention of urine since the third afternoon. There was no female catheter; so with great care I used a male metal catheter against her will, removed a lot of urine in the afternoon, and relieved the patient of that trouble. I was afraid that the patient might develop local or general peritonitis. In fact there was swelling and tenderness around wound No. 1 and No. 2 was much swollen and full of discharge. I was thinking and thinking, and it occurred to me that I should use Mag-Sulph to treat these wounds. So from the fourth day onward I cleaned the wounds with spirit, put sufficient quantity of Mag-Sulph in the gaps, covered them with gauze dipped in spirit, and dressed them.

To my great surprise all injuries except No. 2 were free of discharge within 4 or 5 days and were nicely healing. Injury No. 2 also was shortly free of discharge and was day by day getting smaller in size and very much less in depth.

In my monthly return of October 1943, dated 1-11-1943, (i.e., on 19th day of the patient's admission), I submitted to the A.D.M.S., Head Quarters Hargeisa, I had passed the following remarks:—"One of the indoor injury cases is a female admitted on 14-10-'43 for 8 incised wounds, from one of which about 5" of mesentery was out. Next day COL. CROSSGILL (working in some other department at Hargeisa) was willing to take her to Hargeisa as it was a serious case, but I thought it advisable not to send her so long a distance, (about two days motor journey by rough kachcha road)

in that condition. Fortunately all her injuries are now healed except one which was $4\frac{1}{2}'' \times 3'' \times 2\frac{1}{2}''$ on her shoulder and is now on the healing point."

The patient was completely cured within one month, and I was waiting for her husband to take her away as she was afraid of being killed on the way if she was sent alone. Fortunately the A. D. M. S., Col. R. A. GILKES, M.C., happened to see that case himself at Erigavo on 16-11-43, and he was very much pleased.

During my last 18 years working in the medical line after passing my examination, I have never seen before so rapid and progressive healing in the already septic and big injuries. So far I have not come across any literature, nor have I heard or seen any one using Mag-Sulp in such cases. I have used it in many other ulcer and wound cases with good results. I have also used it with Zinc Sulph, grs. iii each in oz. i aqua, for conjunctivitis with better results. It may prove equally useful in some ear and nose cases.

When given internally in full dose it drains away the intestines by osmosis through the mucus membrane. Its enema in A. bacillary dysentery gives prompt relief by draining away the bacilli along with the mucus. Similarly it drains away the septic material from the wounds by osmosis through the inflamed layers. There is less loss of fluid from healthy tissue, and thus the wound free of sepsis heals rapidly.

Hope to hear results of experiences from other professional brothers.

N. B.:—After about a week of the injury No. 2 getting free of discharge the patient was dressed on alternate days for some time, and then on every third day without any discharge

Common Misconceptions About Physiology of High Temperatures

Certain popular notions and scientific claims concerning the physiology of heat have been examined in the light of recent experimental work. The following conclusions have been reached:

- (1) Best work performance in hot environments is obtained when men are well hydrated. Contrary to current popular conception, thirst should be quenched thoroughly during periods of work.
- (2) Acclimatization to hot environments appears to be carried out principally by an improvement in the circulation of the blood. The decrease in metabolism and the increase in sweating which occur during several days' exposure to heat appear to be of secondary importance in the process of acclimatization.
- (3) There is no foundation for the belief that protein intake should be limited in hot climates.
- (4) Carbohydrate has no special effect on the ability to work in the heat or on heat exhaustion.
- (5) An adequate NaCl intake (15 to 17 grams a day) appears to be more important to prevent heat exhaustion than to prevent heat cramps.
- (6) Water soluble vitamins (with the possible exception of nicotin) are not lost in significant amounts in the sweat.
- (7) Ascorbic acid appears to have no effect on the prophylaxis or treatment of heat exhaustion.
- (8) There is no satisfactory evidence that water soluble vitamin requirements are increased in hot climates but it should be pointed out that it has not been proved that these requirements are not ultimately affected under these conditions.—TAYLOR, H. L.: 'Some common misconceptions concerning physiology of high temperatures,' Bull. Minnesota M. Found. 4: 90-93, May, 1944.—U. S. Na. Med Bull.

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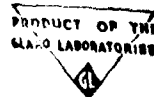
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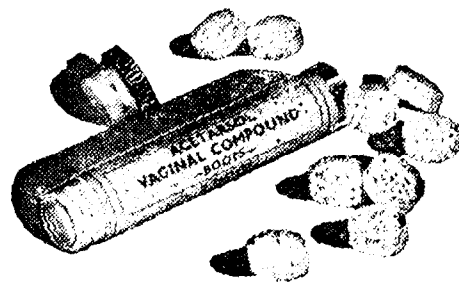
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No. 12.

Etiology of Hypertension

HYPERTENSION, or high blood pressure, is a common disease. Directly or indirectly it is one of the leading causes of chronic invalidism and death. In spite of extensive research and improvement in the knowledge with regard to hypertension that is now available, it is still a medical problem of major importance whose nature and origin is still a subject of considerable controversy. Many types of hypertension are of no clinical significance in that they are benign, non-progressive and do not give rise to any deleterious effects. In these disorders, the hypertension is merely a compensatory manifestation of an underlying disease; from a therapeutic point of view, therefore, much importance need not be given to this blood pressure. The type of hypertension which should cause anxiety to the patient as well as the physician is a progressive disorder affecting mainly the arterioles and ending eventually in cardiac failure, cerebral hæmorrhage, or renal insufficiency. The knowledge of this disease is far from complete. Three systems of the human body, however, are considered as playing important roles in the development of human hypertension. These are the kidney and renal systems, sympathetic nervous system, and the walls of blood vessels.

The kidney has long been suspected as being intimately concerned with human hypertension. A permanent elevation of the systolic and diastolic blood pressures is a prominent symptom in a variety of diseases, in many of which the kidneys are implicated. The older workers assumed that the blood pressure was raised in order to overcome the obstruction offered by arterio-capillary fibrosis or renal fibrosis. This, however, was soon abandoned, because in the majority of cases renal function is not seriously impaired and the kidneys show little gross alteration in structure. On histological examination, however, in the large percentage of cases, a variable but usually a considerable number of the glomerular afferent arterioles show degenerative thickening of their walls of such a degree that the volume of blood normally dealt with by the kidney must be significantly reduced although enough blood reaches the kidneys to maintain their cells in health and enable nitrogenous waste to be properly excreted. It is obvious, therefore, that the cause of essential

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hypertension is extra renal, and it would have to be shown that simple renal ischaemia of the type found in primary hypertension is entirely without effect on blood pressure.

To elucidate this point, GOLDBLATT of Chicago, devised a series of experiments with the object of copying the simple renal ischaemia of primary hypertension as closely as possible. He has been one of the most outstanding contributors on this subject. He produced chronic hypertension by reducing the blood supply to the kidney by means of a clamp on the renal artery. His first experiments were on dogs and monkeys. The first results obtained by partial compression of one renal artery was significant elevation of blood pressure, which was maintained for weeks or months, but usually fell to normal within one month. If, however, both arteries were partially constricted, either at the same time or with an interval between the operations, significant persistent hypertension resulted and was maintained for a number of years. In all the above experiments GOLDBLATT showed that both systolic and diastolic pressures were raised and that in all animals with long-standing elevation of pressure there were no signs of impairment of kidney function. These experiments afford convincing proof that the presence in the body of ischaemic kidney tissue is in some way responsible for the elevated blood pressure. GOLDBLATT showed that the removal of the above mentioned clamps even when hypertension existed for months, was followed by an equally prompt fall of blood pressure. He also proved that bilateral nephrectomy is not followed by hypertension, but if one kidney be removed and the other transplanted into the neck or groin then constriction of the blood supply to the transplanted organ is followed by hypertension. It therefore seems positive that the ischaemic kidney must be present in the body in order that hypertension shall occur. It therefore seems possible that this ischaemic kidney liberates into the circulation a chemical substance which induces widespread arteriolar hypertonus. It is likely that this substance is a hormone and not a pathological product of disordered cell metabolism and that it is antagonised by an antipressor substance. A substance known as Renin having a powerful and prolonged pressor action can be extracted from normal kidneys. Workers have claimed to show that ischaemic kidneys of hypertensives contain more renin than normal kidneys. It is presumed that the hormone renin is one of those excreted with the ischaemic kidney in Goldblatt's experiment. This renin, after entering the blood stream, is supposed to act upon its substrate "hypertensinases (renin-activator), a plasma globulin, to produce a pressor substance "hyertensin" (angiotonin). It is heat-stable and is probably a polypeptide. It is therefore but natural to assume that the ischaemic kidney tissue either produces the normal renal pressor substance in excess or some substance having a similar but more powerful pressor action. It seems equally certain that the normal kidney excretes something which neutralises or destroys it. This group of enzymic substances are widely distributed throughout the body. It has been found by workers that renin can be demonstrated in the blood only during the period when the blood pressure is rising after constriction of the renal artery. When the blood pressure is maintained at a certain level renin seems to disappear though pressor substance of a similar nature has been demonstrated in the blood. It is suggested, therefore, that when the blood pressure reaches its maximum, some other pressor mechanism of the kidney comes into play; there is

however no definite evidence for such a hypothesis. On the whole there is no doubt that the kidney plays a fundamental role in the production of human hypertension and there is also no doubt that there are many gaps in the evidence. The main weakness in the renin hypothesis is perhaps the failure to demonstrate by direct means renin in the blood of animals and patients with chronic hypertension.

That the sympathetic nervous system is intimately concerned with human hypertension comes from the surgeons who resect varying amounts of, and, in a few instances, the entire sympathetic nervous system, to produce, to a certain extent, the lowering of blood pressure in the hypertensives. It has now been felt, that partial or total sympathectomy does not cure the disease, but may have the effect of lowering blood pressure. In patients with advanced hypertension due to arteriosclerosis, sympathectomy has little effect, though, it improves the patients symptomatically and slows down the rapid progress of the disease.

With reference to the endocrine glands, the consensus of present day opinion relegates to them only a subsidiary part in the control of blood pressure. The hypertensive effects of adrenaline and the low blood pressure of Addison's disease have perhaps over-emphasised the importance of the adrenal glands. The ovaries were said to have a hand in the control of hypertension. This probably was because an elevation of blood pressure was found at the menopause. But convincing proof of this relationship has not been forthcoming. The thyroid and the pituitary have been suspect at various times but proof has not been forthcoming that they play any part. Finally it is right to emphasize that our knowledge of extra-renal factors in the production of hypertension is far from complete.

Although renal ischaemia is considered to-day to be the most important cause of hypertension, diffuse arterial and arteriolar sclerosis or spasm, irrespective of renal involvement is still to be considered in any aetiological classification. There is good reason for the assumption that sustained vaso-spasm in the periphery may well precede the production of arteriolar sclerosis. Certain causes of this increased arteriolar tonus have come to light like angiotonin; others will doubtless come to light. Perhaps agents like alcohol, nicotine, lead etc., may in the future be found guilty.

The evidence now available regarding the aetiology of hypertension is not complete. There are many gaps in this evidence. Perhaps research in this line will unravel many of the complications of a condition which is fraught with serious consequences to the individual and which has for a long time been a stumbling block to the physician in the field of practical therapeutics.

Gleanings From Medical Press

MEDICINE and THERAPEUTICS

The diagnostic problem of jaundice.—Whilst the differential diagnosis of the cause of jaundice may present one of the most puzzling of clinical problems, fortunately, as F. W. White (*The New England Journal of Medicine*, March 23, 1944, 230, 344) points out, cases of jaundice are seldom emergencies and there is therefore usually time to investigate them fully. As a result of a careful investigation of 500 cases of jaundice, White stresses the following points:—The age of the patient is an important consideration; under the age of thirty, 40 per cent. of cases are infective hepatitis; in middle age, cirrhosis and cholecystitis account for the bulk of cases; whilst over the age of fifty, tumours account for 80 per cent. of cases. Painless jaundice in youth suggests infective hepatitis, whereas over the age of fifty it suggests cholecystitis, cirrhosis or tumour. Fever occurs in infections of the gall-bladder, bile passages, liver or portal vein, as well as late carcinoma and severe acute hepatitis; if high and sustained it is of grave prognostic significance. In the differentiation of acute liver disease from acute necrosis in chronic liver disease, gross changes in the size of the liver, out of proportion to the severity of the attack, at the onset of the condition suggest the latter diagnosis. Severe jaundice of short duration, with much loss of liver function, indicates hepato-cellular damage rather than obstruction. Enlargement of the liver is so common in jaundice as to be of little assistance in differential diagnosis of the cause; the presence or absence of nodules is of some assistance, these having been found only with tumours, cirrhosis and hepatic lobatum. A palpable dilated gall-bladder was found in only 9 out of 29 cases of malignant obstruction of the common bile duct, and even when present it may be difficult to palpate. Splenomegaly is of considerable value, being present in about a quarter of the cases of cirrhosis but seldom found with tumours of the liver. The presence of spider angiomas in the area drained by the superior vena cava, i.e., face, shoulders, neck and arms, suggest cirrhosis. Tests of liver function are of little diagnostic value, the main exception to this rule being that continued complete absence of urobilinogen in the urine for more than two weeks is strongly suggestive of complete obstruction of the bile ducts. The total blood cholesterol is usually increased in obstructive jaundice, and a rapid rise to normal of the blood prothrombin after the administration of vitamin K favours a diagnosis of obstructive jaundice or healing acute hepatitis rather than chronic hepatitis (cirrhosis). It is important to remember that the presence of bilirubin in the urine does not necessarily exclude "acholuric" jaundice; White found abundant bilirubin in the urine in five of

fourteen cases in which haemolytic jaundice was combined with cirrhosis, gall-stones or passive congestion of the liver. In the diagnosis of acute pancreatitis with jaundice, early tests for diastase in the urine are often of value. A positive Wassermann or Kahn reaction in the blood in jaundiced patients does not usually indicate syphilis of the liver. —*Practitioner*.

Acute transverse myelitis.—By James Burnet, M.A., LL.B. (Lond.), M.D., F.R.C.P.(E.).

This condition is certainly much more frequently encountered in hospital than in private practice, but every general practitioner ought to have some knowledge of this disease, even if sooner or later the patient has to pass out of his care. Acute transverse myelitis may be due to several causes. Let us briefly consider some of them.

Cold and exposure.—In such cases fatigue is a markedly predisposing factor. Suppose a labourer gets chilled while at work. He goes to bed in a tired-out condition. During the night he feels cold and shivery. In the morning when he gets out of bed his legs and feet feel heavy, and he has "pins and needles" sensations in them. He moves them awkwardly. If he goes to work this weakness increases and he has to leave off at mid-day. It is more difficult for him to get home than it was to go to work in the morning.

2. Compression of the cord.—This may be by caries of the spine (tuberculosis), injury (fracture), tumours, including aneurism (rare).

3. Fevers.—This is not a very common cause. Of all the specific fevers enteric is the only one of much importance in this connection.

Let us now consider the regions of the cord which may be affected.

1. The space between the two enlargements in the dorsal region. This is the commonest site. The chief cause here is exposure to cold such as prolonged wetting. In a fully developed case both sensation and motion are affected. The legs are anaesthetic and the patient has a painful band round the waist, technically known as a "girdle sensation." If sensation is abolished so is motion, for first of all we get disturbance of sensation (tingling), then motor paralysis and finally sensory paralysis. The reflexes are exaggerated, for the brain control to the cord is cut off. Bye and bye, when descending sclerosis sets in the reflexes will be exaggerated from this cause also. In a great many cases the patient loses control of his bladder. The bladder may either become distended and remain in this condition so that the urine dribbles away. In such cases you are apt to think that the bladder has been emptied, but on examination you will find it has not been. It is really a case of

distension with dribbling. In other cases the bladder may become distended and emptying occurs as a result of the stimulus of the distension. In such cases the bladder is really emptied into bed. Here it fills and empties itself at intervals.

2. Lumbar enlargement.—Here we get a flaccid paralysis of the legs. They become flaccid and wasted, while the reflexes are abolished. The bladder centre is implicated and destroyed. Three centres lie together, viz., micturition, defecation and sexual reflex centres. When one is affected the other two are also. Here we get total bladder paralysis. Both the detrusor which expels and the sphincter which retains, are paralysed and so urine dribbles from the ureter in the bladder and dribbles out by the urethra from a bladder which in this case is empty. If the centre for defecation is involved, then the anus will become patulous and the bowel contents will keep on escaping.

3. Cervical enlargement.—In this case the inflammation may have spread up from the dorsal region. The small muscles of the hand are first affected. Should the lesion extend higher the muscles of the arm become involved, and should it reach the higher portion of the cervical enlargement the deltoid muscle will become paralysed.

We may also get spinal myosis, i.e., permanent contraction of the pupil. Respiration is interfered with. If the lesion is below the origin of the phrenic nerve, only the intercostal muscles will be paralysed, but if it is above the origin of the phrenic nerve it will be speedily fatal, as the action of the diaphragm is then also paralysed as well as that of the intercostal muscles. Note that in a lesion involving the cervical enlargement of the cord there is wasting with paralysis in the arms, and we also get wasting without paralysis in the legs. This is, therefore, a very serious type of lesion. Within a week or ten days the patient may become hopelessly paralysed, although I have seen a few fairly successful results even in advanced cases.

As regards treatment, absolute rest in bed, which means a water bed, is essential. Remember the skin, bladder and bowels in treating these cases. Keep the skin clean and avoid bed sores. Watch the bladder and use the catheter as well as wash it out, and use the enema to keep the bowels empty. Avoid contractures by ever watching the patient's position in bed. Tonics, massage and movements of the limbs will do much to improve the patient's condition. Don't let such a patient become completely bedridden and hopelessly paralysed if you can possibly help it. —*Medical World*.

Rationale of feeding rather than starving patients with severe hæmatemesis or melæna.—1. Withholding food and drink does not rest stomach, as strongest peristaltic waves occur when stomach is empty.

1. Marked shortening of clotting time during absorption of mixed meals, due only to the protein fraction of the foods.

3. Patients starved 24 or 48 hours much more likely to bleed again than patients fed at once.

4. a. Exhausted patients die after hæmorrhage in spite of scrupulous dieting.

b. Patients with protracted hæmorrhage sometimes stop bleeding when given food.

c. Ambulant patients frequently recover from severe melæna without making any change in diet.

d. Marked reduction in mortality (1935, 1939).

5. The presence of food in the stomach increases the tone and the stomach maintains a constant and continuous pressure on its contents. This increase in pressure tends to close an open vessel and promotes clot formation.

6. Regeneration of blood occurs much more rapidly with the administration of food.

7. Convalescence is shortened.—Schiff, L. Treatment of bleeding peptic ulcer: with report of 160 cases treated by prompt feeding program. *South. M. J.* 37: 335-342, June 1944.—*U. S. Na. Med. Bull.*

Difficulties in diagnosis.—In a recent article on meningo-encephalitis, Prof. H. Cohen (*Post. Grad. Med. Jour.*, 1944, 290, 61) issues a timely warning as to the difficulty in diagnosing between chronic and acute disease. Thus a typhoid case with headache and bradycardia may lead to the diagnosis of meningitis and pneumonia may be overlooked on like grounds. Pneumonia may be the mistaken diagnosis of a case of poliomyelitis in which the temperature and pulse may be raised, the face cyanosed, the breathing rapid and the headache severe. The tachypnoea and cyanosis are due to paralysis of the respiratory muscles. Lesions which appear suddenly or develop maximal signs within 24 hours are due to vascular accidents such as hæmorrhage, thrombosis or embolism. In subarachnoid hæmorrhage the patient is seized when in good health with agonising pain in the head followed by neck and back rigidity. In epidemic times when encephalitis is being notified cases of tuberculous meningitis, cerebral thrombosis and intracranial tumours are wrongly diagnosed as cases of epidemic encephalitis. The site of the symptoms gives a clue to diagnosis. Pneumococcal meningitis which affects the vertex gives rise to excruciating pain but to no nuchal rigidity which is so common in meningococcal and tuberculous meningitis. As to age 50 per cent. of the cases of tuberculous meningitis occur between 6 months and 4 years; 70 per cent. of cases of poliomyelitis are under 4 years of age. Concerning the cerebro-spinal fluid stress is laid on the fact that in syphilitic and tuberculous meningitis, poliomyelitis, herpes Zoster and poliomyelitis the fluid may be clear. The type of cells depends upon the acuteness of the inflammation rather than its cause. A polymorphonuclear leucocytosis is the common finding in meningococcal and acute

coccal infections while in the less acute tuberculous and syphilitic infections a lymphocytosis is usually found. But in acute pharyngitis and in acute meningitis tuberculous infections and in acute meningitis syphilis 90 per cent. polymorphonuclear have been found, and in chronic meningitis 90 per cent. lymphocytes.

The chemical composition of the cerebrospinal fluid approaches that of the blood plasma, but glucose gradually diminishes and lactic acid appears. A finding of less than 600 mg of sodium chloride in a clear fluid is diagnostic of tuberculous meningitis in part due to the fall in blood chloride. The normal glucose and chloride content in encephalitis lethargica differentiates this disease from tuberculous meningitis.

In meningitis the infection may be by the blood stream but in most cases and especially in tuberculous meningitis and in acute viral lymphocytic choriomeningitis, by way of the choroid plexuses and ventricles. From the choroid the infection spreads downwards and infects the posterior basal region of the brain around the cisterna magna spreading thence to the inner and upper aspect of the cerebellum so in the early stages a lumbar as distinguished from ventricular puncture may yield a perfectly normal fluid. The chlorides and sugar in acute lymphocytic choriomeningitis, other viral infections and in syphilitic meningo-vascular cases are not diminished. Glucose is not diminished in acute viral conditions and syphilitic infections.—*Medical Officer.*

Back pain and gastro-intestinal disorders.

—Patients who have maladies involving digestive or accessory digestive organs, such as the gallbladder or the pancreas, frequently complain of pain in the back. Nor is this complaint of minor importance symptomatically to many of these patients. Indeed it is often the presenting, or even the sole, complaint. It may overshadow other symptoms in severity, and only careful evaluation will elicit the information that it is but one of the manifestations of a disease located in the gastro-intestinal or accessory gastro-intestinal tract. All of the diseases involving these tracts may cause pain referred to the back, and much information of the highest diagnostic and prognostic importance will be lost if such distress is not evaluated carefully. Back pain as one of the manifestations of gastro-intestinal diseases can result from a summation of impulses originating in visceral walls and referred to the back along the sympathetic nerves which carry such impulses to the spinal cord. Accurate localization of the involved organ or of erosive progression of histopathologic processes or even the detection of involvement of neighboring organs in the

course of progression of a disease may be possible by means of critical scrutiny and proper evaluation of references of pain from the epigastrium to the thorax, neck or back. —RIVERS, A. B., and RICHARDSON, A. L.: Back pain in disease of gastro-intestinal and accessory gastro-intestinal tract. J. A. M. A. 125: 121-126, June 10, 1941. U.S. Nat. Med. Bull.

Malaria. In this paper the author gives his experience with the treatment of malaria and of the B.P. in the treatment of malaria and compares its value to those of the so-called malaria specific and shows that Iodine is the best of all the drugs for malaria. He states that the three known specific, Quinine, Plasmoquine, and Malarin all have drawbacks and limitations, and none of these will cure all cases, and none of them nor any of the cinchona products will prevent any of the relapses. He also adds that none of the so-called specific will insure infection in the safe doses and would be of much value in the control of malaria on a community scale. Moreover all these may be toxic in effect. But Iodine has none of the drawbacks and limitations of Quinine. The author says that since 1920 he has not ever prescribed a single grain of Quinine either as a prophylactic or for treatment but instead he prescribed the following mixture in all cases of malaria.

R. Tr. Iodine (Rect.)	10-15 drops.
Spt. Chloroform	20 drops.
Aqua ad.	2-3 ounces.

Mix. must. for a dose.

Thrice daily, continued for 3 weeks.

The author states that this simple but extremely potent remedy (Iodine) has not failed him for the last 24 years and a single patient has died, all have recovered.

Then the author gives a brief explanation as to how Iodine acts in the cure of malaria. He says that like Quinine, Iodine is not a direct antidote to the malarial parasite but it cures the disease by helping the natural resistance to neutralize the parasite. Now, the resisting power of the body is lowered when the thyroid system is below par, and when the malarial parasite infiltrates into the system and causes fever when this defense mechanism of the body is below par or when the thyroid system is defective due to deficiency of Iodine for any reason. Thus Iodine cures malaria by augmenting the impaired activity of the thyroid gland.

The author highly recommends this drug for the treatment of this terrible scourge which has been causing havoc among the people of India specially during these days of Quinine scarcity.—Abstracted by D. N. Dehsarma, F.M.M.S., Malariaologist, A.M.O., Bholaaguri, T. E. from a paper by Major J. J. A. Brachio, I.M.D., Civil Surgeon, published in the *Assam Review and Tea News*, Aug. '44, p. 367.

SURGERY

Succinyl sulfathiazole in bowel surgery.—In large bowel surgery specific measures have been directed against the risk of infection, both in the peritoneum and in the abdominal wall. They have consisted of: (1) stage operation; (2) attempts to decrease the bulk content; and (3) attempts to alter or decrease the number of the organisms in the fecal stream. With increasing knowledge of the role of protein in the surgical patient, it is obvious that the so-called "colon preparation" diet is by no means an adequate diet in the preparation of patients for major surgical procedures, particularly of patients with gastro-intestinal lesions who may already have depleted protein reserves from preceding relative protein starvation. With succinyl sulfathiazole a new, more direct method of attack on intestinal bacteria is made and offers the opportunity for providing a better balanced and more palatable diet to patients with impending operations on the colon and rectum.—Archer, H. L., and Lehman, E. P.: Clinical and Laboratory experiences with succinyl sulfathiazole. *Ann. Surg.* 119: 518-524, April 1944.—U. S. Nat. Med. Bull.

The surgical treatment of chronic pulmonary abscess.—In a discussion of the treatment of chronic pulmonary abscess, Lindskog calls attention to the fact that a large percentage of patients with pulmonary abscess first come to the surgeon in a chronic stage with one or more local complications. He advocates primary resection without preliminary drainage as the procedure of choice in chronic abscess when one or more of the following conditions exist: (1) multiple abscesses or extensive destruction in one or more lobes; (2) secondary bronchiectasis and pneumothorax; (3) atelectasis and pneumonia unrelieved by bronchoscopic treatment; (4) uncontrolled bleeding; (5) perforation and localized empyema. Evacuation of the empyema and resection of the involved lobe in a single-stage operation in the author's experience is both technically feasible and reasonably safe.

He reports on 44 patients with chronic abscesses and complications varying in duration from three months to several years. Four patients had already had one or more drainage operations performed elsewhere. Three were critically ill with extensive empyema, and were treated by simple thoracotomy. Twenty-two, principally earlier cases, were subjected to one-stage or multiple-stage pneumonectomy. Of these, six subsequently were submitted to pulmonary resection. Fourteen patients were treated by primary resection, all lobectomies. The average duration of the disease was 11 months, excluding two long-term cases. The average patient sought the first medical attention within one month of onset, so that undesirable delay can only be ascribed to ill-advised persistence in conservative treatment by the medical or surgical attendants. Five patients subjected to primary lobectomy and pre-existing perforations with encep-

sulated interlobar or parietal empyema. The gross mortality was 10, or 22.8 per cent. The drainage operations (thoracotomy and pneumonectomy) contributed 7 fatalities or 28 per cent. and were followed by 60 poor results necessitating secondary resection. The best results were obtained with the 14 primary lobectomies. In this group there was one death (7.1 per cent.), an operative accident. The patient, aged 6 years, had a large post tonsillectomy abscess in the right lower lobe of ten months' duration. During operation the abscess evacuated its semi-solid content into the trachea and the obstruction was not relieved by bronchoscopy. Among the remaining cases, 12 showed very satisfactory results. The 10 secondary resections included three total pneumonectomies and 7 lobectomies.

Primary lung resection was associated with lower mortality (7.1 per cent.) and better results than other types of treatment. Secondary resection after previous drainage operations was useful for the salvage of otherwise unsuccessful cases. This operation was followed by no immediate mortality but a higher incidence of late complications and deaths which increased the eventual mortality to 12.5 per cent.

(Lindskog, G. E., *Surgery* 15: 783-788, May, 1944).—U.S.O.W.I.

Certain "don't's" in shock therapy.—First, do not use digitalis which not only is of no value but actually may be harmful. The heart in uncomplicated shock is not at fault, but rather the peripheral circulation. Second, do not administer epinephrine because it raises blood pressure. Epinephrine has been used experimentally as a method of inducing shock and pulmonary edema. Finally, omit stimulants such as caffeine and strychnine. They have no value in correcting the defects present in shock, and may make the patient unduly restless.

We feel that it is advisable to withhold all chemotherapy including all substances containing chemotherapeutic agents until the patient's urinary output exceeds 700 c.c.; otherwise, toxic levels of the drug are to be expected. In oliguric patients attention should be directed first toward improving urinary excretion. When adequate output has been obtained, chemotherapy may be employed orally or parenterally, according to the patient's condition.—Segal, M. S., and Aisner, M.: Management of certain aspects of gas poisoning with particular reference to shock and pulmonary complication. *Ann. Int. Med.* 20 (O. S. 25): 219-227, February 1944.

Contraindication to pentothal anesthesia.—In the presence of certain types of injuries or conditions, the use of pentothal is hazardous. Among the most important of these are morphine overdosage, shock, infections of the neck, and liver damage. The danger of pentothal in operations on cervical or sublingual infections has been repeatedly emphasized and a number of deaths have

been reported under such circumstances. Apparently, inflammation in the region of the carotid bodies and sinuses causes sensitization of reflexes arising there. Because pentothal anesthetizes the central nervous system more rapidly than the carotid sinus, these reflexes, initiated by operative trauma exert a relatively more powerful inhibitory effect on the respiratory center, thus accounting probably for the notorious incidence of sudden death during such operations.

In general, pentothal should be avoided when the operative position or procedure may interfere with the airway or make artificial respiration difficult, as in operations that must be performed in the face down position, in operations on maxillo-facial injuries or other injuries involving the airways. In intracranial surgery, pentothal is not considered a wise choice because such operations are usually long and are associated with great blood loss. Patients with severe burns seem to tolerate pentothal anesthesia poorly. (News and Comment: Pentothal Anesthesia. Bull. U. S. Army M. Dept. No. 76, 1-3, May 1944.)

Cause of pentothal fatalities.—Pentothal, like all barbiturates, is depressant to the central nervous system, especially the respiratory center. By destroying the sensitivity of the respiratory center to its normal chief stimulus, carbon dioxide, under full pentothal anesthesia the body must make use of a supplementary mechanism to maintain respiration. Accordingly, a shift is made from the driving action of carbon dioxide on the respiratory center to the sinu aortic mechanism. The respiratory stimulation of pentothal may then be interpreted by uninformed anesthetists as an indication that the patient is waking up

rather than that the patient is not getting enough oxygen, and a wrong interpretation here leading to the further administration of pentothal can cause the patient's death. Since the true depth of pentothal anesthesia is difficult to determine when there is a low oxygen content in the blood, the continuous titration of oxygen with pentothal is always desirable and should certainly be done in the longer operative procedures. Since carbon dioxide is a depressant to respiration under pentothal anesthesia, its use as a respiratory stimulant in the treatment of respiratory depression caused by pentothal is contraindicated. (News and Comment: Pentothal Anesthesia. Bull. U. S. Army M. Dept. No. 76, 1-3, May 1944.)

Nonspecific ulcerative colitis. Nonspecific ulcerative colitis is an inflammation of the large bowel, including the rectum, without known etiology, occurring in cycles and usually accompanied by diarrhea with sanguineous and/or mucopurulent discharge. The lower portion of the bowel is most frequently involved, but the process may be generalized. The amount of discharge depends on the severity and degree of involvement. Diagnosis is made by sigmoidoscopy. The absence of haustrations as seen by X ray is significant. Characteristic inflammatory ulcers are seen which break down and form abscesses. There is often muscular hypertrophy, the rectal muscles and tenia being most commonly affected. The lumen of the bowel may become enlarged or narrowed. In the latter instance, spasm may be responsible or contraction may have led to organization and permanent blocking, necessitating operation. (Daniels, G. E.: Nonspecific ulcerative colitis as psychosomatic disease; definition, clinical and pathological picture. M. Clin. North America 28: 593-602, May 1944. J. S. Na Med. Bull.)

OBSTETRICS and GYNÆCOLOGY

An experience with 100 cases of continuous caudal analgesia.—This study covers 100 cases and was conducted in the obstetrical department of Indiana University. Forty cases, or 40 percent of the series, including two cesarean sections, were completely relieved of pain. Another 40 cases (40 per cent) were partially relieved. Twenty cases, or 20 per cent, of the entire series were complete failures. Eighteen of these 20 cases were due to inability to enter the hiatus properly. The remaining two were due to intravenous injection, necessitating the discontinuance of the method. The maternal complications, although not of a large variety, did in a few instances manifest themselves in a serious manner. Two outstanding cases were those of respiratory and vascular collapse. Both were cesarean section cases. The most frequent complication was drop in blood pressure. A majority of the cases experienced this reaction to some degree; 12 (15 per cent) of the 80 analgized cases had a fall of over 20 points in the systolic level. The welfare of the fetus was involved in

but two instances, but unfortunately to a catastrophic degree. One infant was lost and the other permanently damaged. It is, of course, impossible to demonstrate a direct relationship between these two disastrous results and the obvious periods of anoxia which these infants experienced during intrauterine existence. There is no doubt that the circulatory collapse encountered in both instances was due to the anesthetic agent. Similar episodes have been mentioned by other authors and have consistently been minimized. No mothers were lost but there was an uncorrected fetal mortality of five. One infant was hydrocephalic, two died in utero of unknown cause, and one death occurred neonatally. The death of the fifth infant was attributed to continuous caudal analgesia. The average interval between inception of analgesia and termination of labor was six hours. In many of the cases the authors had difficulty in maintaining anesthesia over prolonged periods. In these cases the maximum desirable effect would begin to wane after

about six hours. Thereafter larger and more frequent instillations would be required. Blood loss associated with caudal anesthesia has been definitely less than with other methods of analgesia used in their clinic. Not infrequently, the amount of blood escaping from the episiotomy wound exceeds that from the uterus.

Special protection to the premature infant is perhaps the most outstanding single contribution of continuous caudal anesthesia. No other method of relief, or even the absence of relief, affords the premature such security. It would appear that prematurity is one of the method's chief indications—providing the maternal blood pressure can be maintained.

The disadvantages of continuous caudal analgesia are as follows:—1. The method is not well adapted to private practice. Not only must the attendant report early in labor to insert the needle or catheter, but he must remain close in attendance throughout the period of anesthesia, not alone to administer the anesthetic but to check carefully the level of the cutaneous anesthesia.

2. Since the method involves invasion of the caudal canal and carries hazardous potentialities, it is a major surgical procedure and should be conducted only by those fundamentally trained in this specialized form of relief.

3. The method carries an undesirably high percentage of failures approximately nine percent in the hands of the more expert.

4. Such contra-indications as hypotension, hypertension, eclampsia, placenta previa (increased hemorrhage from cervical relaxation), uterine inertia, acute hemorrhage sensitivity to the drug, anemia, hysteria, psychotic states, disproportion and certain sacral anomalies should be carefully heeded.

5. Obesity, a small hiatus, or a deformed sacrum not infrequently causes difficulty in inserting the needle.

6. Intra-uterine manipulations such as internal versions, are usually unsatisfactory because of the increased tone of the upper uterine segment and the failure to eliminate discomfort from manipulations made through the abdominal wall above the level of the umbilicus.

7. There is a possibility of peripheral nerve damage from a prolonged bathing of the nerve roots with anesthetic agents.

8. There is a risk of spinal infection. Manalan reports a case of staphylococcus meningitis. In their analysis of 10,000 cases of caudal anesthesia Hingson and Edwards report four cases of peridural infection, including one in their own series, which terminated fatally as a peridural abscess.

9. The bladder urge is lost. Not infrequently urine escapes during uterine contractions from pressure of the advancing part or has to be removed by catheter.

10. The desired anesthetic effect is difficult to maintain over six hours. For this reason it has been found to be most practical to delay the caudal anesthesia until

the pains are two or three minutes apart, the lower segment well effaced, and the cervix at least two centimeters dilated.

11. It is exclusively a hospital procedure, and is therefore restricted to approximately 60 per cent (61.2 per cent in 1941) of laboring women. The necessity for a competent anesthetist-obstetrician and special facilities further restricts the use of the method.

12. Although the first stage of labor is shortened and the third is simplified, the second stage is prolonged and necessitates an increased operative interference.

13. Because of the absence of secondary powers and the added fetal embarrassment resulting from the extra prolongation of labor, the method is not suitable in trial labor or borderline disproportion cases.

14. A majority of patients manifest a drop in blood pressure, varying from a mild to the extreme degree that accompanies fatal cardiovascular collapse.

15. There is danger of breaking the needle in the caudal canal. Breakage of the needle may require incision and even laminectomy for its removal.

16. Above all, the method presents a notable mortality for both the mother and the infant. Hingson and Edwards in their 10,000-case report, covering the experiences of 55 clinics, record four maternal and two fetal anesthetic deaths. In addition, they report in the same article one maternal death and one fetal death in their own series of 1,150 cases attributable to the method. In 1920 Zweifel in a series of 4,200 single caudal injections reported three maternal deaths attributed to the anesthetic. All three deaths occurred within a few minutes of respiratory failure. Autopsy was obtained on two of them and demonstrated puncture of the dura. Block and Rochberg report three maternal deaths with single injections among the first approximate 600 cases done in Baltimore. Each of these deaths was likewise attributed to the injection of lethal anesthetic doses into the subarachnoid space. These last fatalities are stated to have occurred despite "strict observance of all ordinary precautions."

These single injection deaths can be reasonably included with those of the continuous technique, in that not only is the same principle involved, but, frequently, delivery is so imminent that time does not allow for more than the initial injection of the continuous procedure. It is significant that the ratio of the maternal mortality to the infant loss, resulting from the use of the method, as recorded in the 10,000-case survey made by Hingson and Edwards, and that of their own 1,150 cases is five to three. This major maternal mortality and the fact that the majority of complications from the method befall the mother make continuous caudal analgesia unique.

The incidence of the maternal loss in the above joint report was 1 death in 2,230 cases. When one combines the figures of the continuous and single injection groups, the resulting mortality incidence is found to be 1 maternal death in approximately 16,000 cases (10 in 15,950).

17. Another real handicap of continuous caudal analgesia is its restricted usefulness. In addition to the exclusion of 40 per cent. of laboring women who are delivered in homes, there is a very large per cent. delivered in hospitals which are not equipped with the required skill and facilities. Then, too, besides these and the ones eliminated because of clinical and anatomical reasons, there are the approximate nine per cent. of failures. Thus, the method is available only to a minority number of laboring women.

Conclusions.—After reviewing the accumulated findings of capable observers from many leading clinics, the principal deduc-

tion is that although continuous caudal analgesia, as advocated by Huggins and Edwards is excellent to the degree of euphoration in its analgesic achievement throughout both labor and delivery, it is a method fraught with too many highly dangerous complications to be accepted except in specially selected cases conducted by specially trained and skilled obstetricians. The degree of risk is such that the method's safety should not be stressed. Fortunately, the relief of childbirth pain does not require so major a procedure. Other efficient methods are simpler and safer. McGarrick, Huber, Spurr and Callespe. *American Journal of Obstetrics and Gynecology*, March, 1944).

DERMATOLOGY

Eczema of the meatus.—This condition is frequently seen and may extend from outside, i.e., towards from the auricle; or it may be a periostitis extending outwards from an inflamed eustachian tube and tympanum—part of an acute otitis—or it may result from injury; but in the majority of cases it is a simple eczematous process, accompanied by swelling, serous exudation (which may become purulent), and desquamation of the cuticle. If there be much pain it probably comes from the middle ear, and may be responsible for the whole condition. The first thing is to find out whether the middle ear is suppurating, and for this purpose the meatus must be thoroughly cleansed by filling it with hydrogen peroxide, leaving it for five or ten minutes till effervescence has ceased, and then syringing out. It must be repeated once or twice, a considerable quantity of scales and debris will come away, and after drying the parts gently with a cotton brush it will generally be possible to make a diagnosis, unless the lumen of the meatus be very small indeed. For the inflammation of the meatus there is no better application than Burrow's solution, applied on plain ribbon gauze as a packing, and changed daily. A mixture of lead and spirit lotions (equal parts) may be used in the same way. If there be suppu-

ration of the middle ear, the treatment appropriate to that condition must first be applied at each dressing before using the Burrow's solution. As irritation subsides the packing may be done more firmly in order to exert pressure on the walls and restore the normal lumen. A firmly rolled cylinder of absorbent wool answers better than gauze for this purpose, and ointments may be conveniently applied in the same way. Nitrate of mercury ointment diluted 11 to 2 parts of vaseline is an excellent application for eczema of the meatus, and for the dry, superficial, scaly variety an occasional painting with silver nitrate (gr. x-xx to 3 i spt. with nitros.) is most effectual. In some cases the eczema is confined to the groove behind the ear. As the skin of the ear, like that of the eyelids and certain other parts, is loose, there is often a good deal of swelling. In these cases astringent and cooling lotions, such as lactate of lead and calamine lotion, give great relief. The remedies for eczema are legion, and no more can be mentioned here. Eczema of the meatus usually readily disappears when it is due to an otorrhoea and the discharge ceases, but it is not infrequently associated with enlargement of the cervical glands.—*Prescriber*.

OPHTHALMOLOGY

The cranial complications of otitis media.—These are often of a grave nature and may produce deafness or even endanger life.

(a) The ossicles become ankylosed, or may die and be cast off in the discharge, the hearing being impaired in either case, but not necessarily destroyed.

(b) The inflammation may extend from the lining membrane of the tympanum to the bony walls surrounding it, giving rise to a limited caries or necrosis of the temporal bone. This may be associated with suppuration within the skull, and any of the intracranial complications mentioned below. The roof of the tympanic cavity (*tegmen tympani*), which is very thin, is especially liable to be affected in this way.

(c) Polypi may also develop, as has been mentioned. They consist essentially of granulation tissue protruding through the opening in the membrane, thereby hindering the escape of the discharge. They should be removed by the snare or curette, and the base touched with a saturated solution of chromic acid; the part is subsequently syringed with a weak solution of carbolic acid and dressed antiseptically.

(d) Facial paralysis not uncommonly arises from sclerosis and thickening of the bony tissue surrounding the aqueductus Fallopii, causing pressure on the facial nerve in the canal. It must be remembered that the bony canal lies immediately behind the tympanic cavity and to the inner side of the passage from the attic to the mastoid

trum (*aditus ad antrum*). In chronic cases, and more especially those of a tuberculous nature, the nerve supply may be actually exposed as a result of necrosis or absorption of the bony wall of the aqueduct, and this may lead to facial paralysis through direct infection, or even destruction of the nerve itself.

(e) Involvement of the internal ear or labyrinthitis results from the spread of the infection inwards, either through the wall of the external semicircular canal or through the fenestrum rotundum or ovale; in the former case the posterior or vestibular portion is involved, in the latter the cochlea. Invasion of the semicircular canals is usually evidenced by dizziness, a tendency to fall towards the affected side, nystagmus and vomiting; pain and fever are present in the more acute cases. Involvement of the cochlea is generally a later manifestation and results in tinnitus and absolute deafness. Infection of the meninges of the brain sometimes arises by spread of inflammation along the internal auditory meatus.

(f) Inflammation may also extend into the mastoid cells, giving rise to the condition known as mastoiditis. When a purulent otitis media extends into the antrum, severe local and general symptoms are likely to result. The patient complains of intense pain in the ear, with tenderness on pressure, and perhaps redness and oedema over the mastoid process. The discharge from the ear often ceases for a time at the commence-

ment of these symptoms, but reappears later on. As the case progresses, febrile symptoms of an intermittent type and even rigors may supervene, whilst the patient becomes drowsy or irritable and restless. An abscess may form under the periosteum covering the mastoid process, with or without caries or necrosis of the outer table of bone; in children, where this bony lamella is thin, it is not infrequently absorbed, and on incising the abscess protuberant masses of granulations, springing from the interior of the bone, may be seen. When such an abscess has developed the auricle is characteristically displaced downwards and outwards. Not infrequently the suppuration extends through the bone cells, and may encroach on the inner aspect rather than the outer, and hence is likely to lay bare the dura mater and expose the lateral sinus; in such cases intracranial complications are probable. Sometimes the trouble is of a very chronic nature and may be tuberculous, the cells being choked up with lymph and inflammatory material of a cheesy nature, whilst the bone itself becomes thickened and condensed. The process feels distinctly enlarged and is the seat of a good deal of deep-seated pain of an aching character, and worse at night. In other cases the discharge is inspissated and mixed with epithelial cells and cholesteroline so as to form flaky masses like the layers of an onion; the condition is known as *cholesteatoma*. It is often the cause of great distension of the antrum.—*Prescriber*.

Correspondence

'Malaria'

To The Editors, THE ANTISEPTIC, Madras.
Sirs,

I read Dr. Krishnamurti's paper on 'Malaria' in the October '44 issue of ANTISEPTIC. It reflects good light on its treatment and other aspects. But there are certain points which one would accept with reserve.

Everybody will agree that alkalies and saline purge have certain catalytic effect in the absorption and action of quinine; but their administration before quinine should not be the rule; rather it should be considered as a matter of convenience. In fact no time should be lost in giving quinine, when the case is diagnosed as malaria, especially M. T. infection.

In certain M. T. infections if we wait for alkalies and saline purge to act and do not begin straight with Quinine, patient would not remain alive to take our Quinine. Such cases though not common do occur.

Again the author is fortunate in treating all types of malaria with an average 5 grains of Quinine a day. But it is too small a dose to be followed universally by all. The possible explanation in his case might have perhaps the cases of his locality might have got certain amount of immunity after repeated attack of malaria and the particular strain of plasmodium might be too susceptible to Quinine. It certainly does not help in our and other places. Indeed it is a big

mistake to give such small doses in the beginning of epidemic. Even if we succeed in some cases, incidence of relapses would be more in them requiring further treatment and so ultimately there would be no saving of Quinine.

Then again gr. 1 of Quinine a day used as a prophylactic dose is too small a dose and is waste of this good medicine. Even people taking 6 grs. of Quinine a day sometimes get malaria, while there are instances when certain inhabitants using no prophylaxis whatsoever get no malaria even in the worst epidemic. Hence in these hard days when Quinine supplies are so short, its prophylactic use should altogether be discarded and other preventive measures e.g., mosquito net, avoidance of exposing any part of body, which can be conveniently covered to anopheles bite, destruction of larva, etc. should be encouraged.

Naraina, } C. L. DHABHAI, L.M.P.,
Jaipur State, } Medical Officer, Naraina.
12-11-'44.

Government School of Indian Medicine
To The Editors, THE ANTISEPTIC, Madras.
Sirs,

I strongly urge that the indigenous systems of Ayurveda, Sidha and Unani be merged and synthesised into one system of Indian Medicine by taking best from each and

boldly discarding the useless and obsolete. This step will certainly enhance the status of Indian Medicine and at the same time bring down the top heavy expenditure on the school now involved without credit. It may be possible to make comparative and synthetic study of the different systems of Indian Medicine with the modern (Western) system of medicine when the school is entirely established for post graduate course with up-to-date full equipment. Such a thing to be aimed at during the period of undergraduate study for a basic qualification in Indian Medicine as it is the case now in L. I. M. School is nothing short of building castles in the air. Post-graduate work will enable to establish by research standardisation and purity test of Indian Medicines with possibilities for their mass production. Votaries of Indian Medicine should not be of the mind as to treat the medical matters of the nature on the basis of Theosophy and Catholicity of religious. They will be doing more harm than good to the cause of Indigenous medicine.

Agitation identifying Indian Medicine with National interests should not outrun its real usefulness and make us abject slaves to the false notions of patriotism and national spirit which are often unwisely stimulated with the slogan as "National Medicine at Jeopardy" and so on. Why cannot the school completely omit from its curriculum Indian Physiology, Pathology, Midwifery and Surgery and openly follow Western lines? It is courage and wisdom. This demand made by the students are of great comprehensive nature and require thorough consultation with expert leaders of the Medical Profession and also the Provincial and Indian Medical Councils. Lay people should leave this serious matter as far beyond their sphere of activities and the Government instead of dealing with the problem drastically will be doing the right thing by reforming it in the lines suggested above.

Guntur, 10-10-44. G. V. Hanumantha Rao,
Hony. Secretary
Andhra Provincial Branch, I. M. A.

Proceedings of Associations

The 21st All India Medical Conference.
—This will be held at Cawnpore on 26th, 27th, 28th and 29th December, 1944. In order to make the Conference thoroughly representative and successful, members of the medical profession all over India are requested to attend and take part in the celebrations.

A Scientific Section is being arranged. Original papers on various branches of the Medical Science will be read in this Section by scientists and members of the profession. An exhibition of surgical and medical products will also be held in this connection.

Indian Medical Association, Guntur Branch.—At the Annual General Body

Meeting on 7-10-1944 with Dr. Ch. S. John, M.B., B.S., in the chair, the annual report on the working of the Association presented by the Secretary was adopted.

The following office-bearers for 1944-45 were elected unanimously:—*President:* Dr. Ch. S. John, Guntur; *Vice-President:* Dr. P. H. Vital Rao, Guntur; *Hony. Secy.:* Dr. G. V. Hanumantha Rao, Guntur; *Secy.:* Dr. P. Subrahmaniam, Guntur. Six members were elected to the Managing Committee.

It was also resolved to appeal to members of the Medical Profession to donate liberally to the Building Fund of the Guntur Medical Club.

Preparations and Inventions

Rolanofele (Distributors—Ranbaxy & Company, P.O. Box No. 104, New Delhi). This is claimed to be Schizontocidal and Gametocidal useful in chronic and acute malaria, giving rise to no by-effects, and having no contra-indications and hence can be administered even during pregnancy.

A full course comprises of 20 tablets spread over a period of 7 days and the price is within the reach of everybody. As a prophylactic 2 tablets daily for 10 days is recommended. Further details will be supplied gladly on request by the distributors.

Notice

Post-Graduate Courses in Medicine.
The Ag. Registrar, Madras University, writes: The Post-Graduate Courses in Medicine will be inaugurated by H. E. the Governor on Wednesday, the 3rd January, 1945, at the Banqueting Hall, Government House, Madras.

Lectures in Medicine, Surgery and Midwifery will be held from the 5th January onwards till the end of March in the City Hospitals, and will consist of over 20 lectures in each of these subjects. The course of lectures in February is specially intended as a Refresher Course for the general practitioners. All members of the medical profession who are desirous of taking the course can attend the complete course of lectures or any part thereof on payment of the fee of Rs. 100. Further particulars can be had from the Honorary Secretary, Council of Post-Graduate Medical Education, University Buildings, Chopaluk, Madras.

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* MILK is Nature's finest example of an emulsion food.

* EGG is another food of great importance and the yolk of which is again the most edible emulsifying agent:

BOTH OF THEM SHOW THAT EMULSIONS ARE OF FUNDAMENTAL IMPORTANCE TO HUMAN BIOLOGY IN HEALTH AND IN DISEASE.

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During and after Bronchitis, Pneumonia and Pleurisy, Petromulsion not only relieves the cough, softens and expels the viscid and tenacious expectoration, but also improves the nutrition, effectually overcomes the constitutional debility so frequently associated with these diseases.

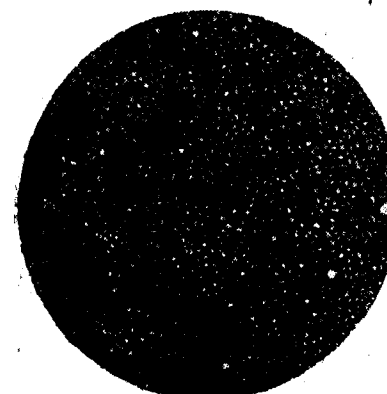
In Gastro-Intestinal Disorders of a catarrhal, ulcerative and tubercular nature Petromulsion is particularly useful. It mixes thoroughly and uniformly with the food-contents of the stomach and intestines. Propagation of Bacteria is inhibited, fermentation is stopped, irritation and inflammation of the digestive tubes are reduced and the elimination of toxic materials is greatly facilitated.

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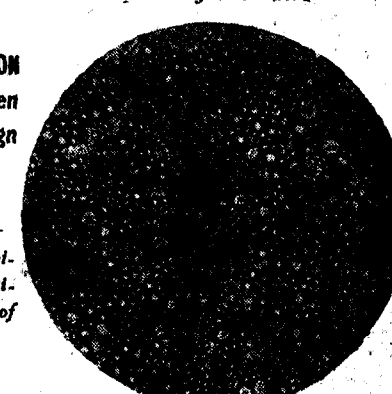


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The Non-toxic Anthelmintic

Diphenan B.D.H. conforms with all the requirements for Diphenan B.P.C.; it is an anthelmintic, highly active against threadworms and remarkably free from toxic effects.

Some gastric disturbance may occur in a few patients during the first day or two of treatment, but, if administration is continued, tolerance is normally established.

For successful treatment, adequate precautions must be taken to prevent reinfestation which readily occurs when precautionary measures are not carried out. The eggs of the parasite are air-borne and, therefore, are likely to be found in the dust throughout the house in which an infested patient lives. Consequently it is advisable to treat all the occupants of the house and to continue treatment until every member of the household is known to be free from parasites.

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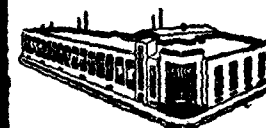
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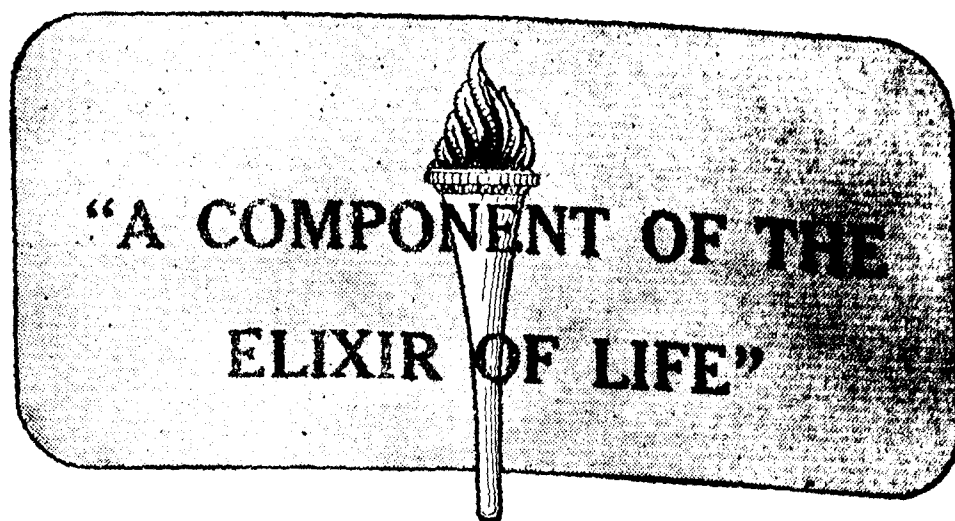
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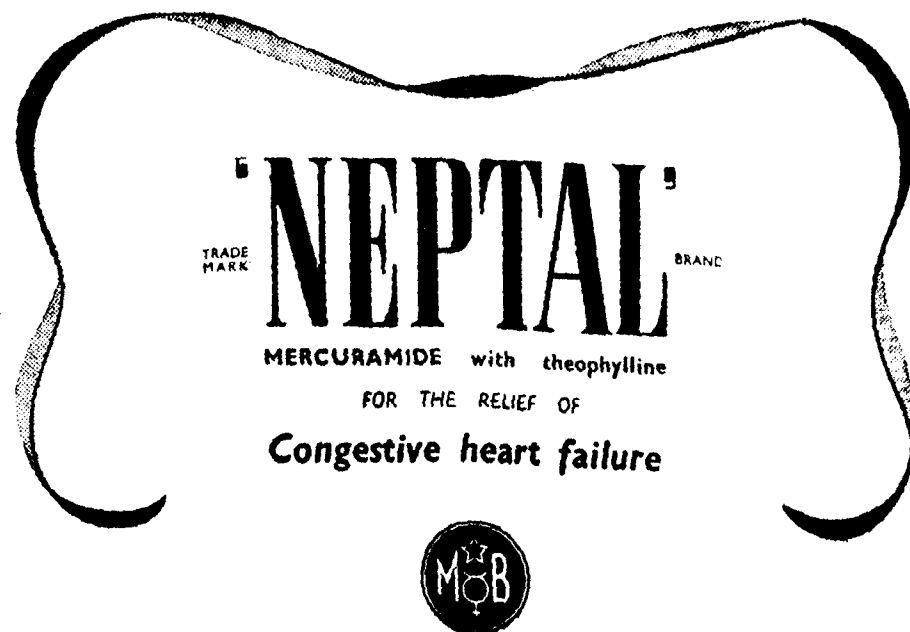
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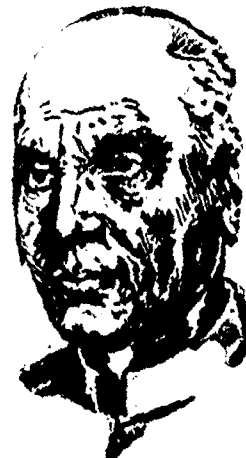
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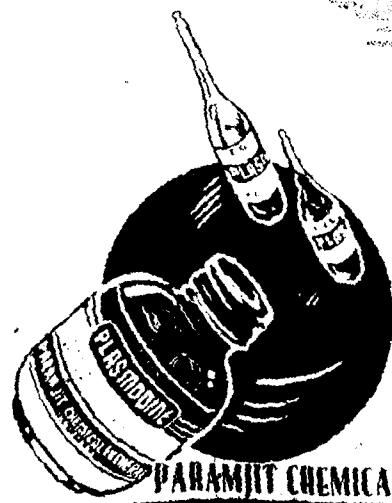
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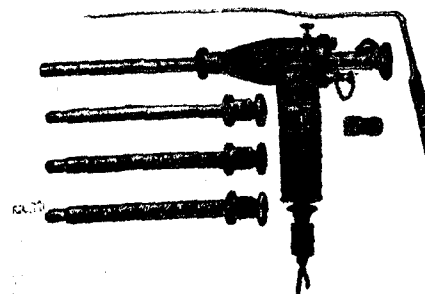
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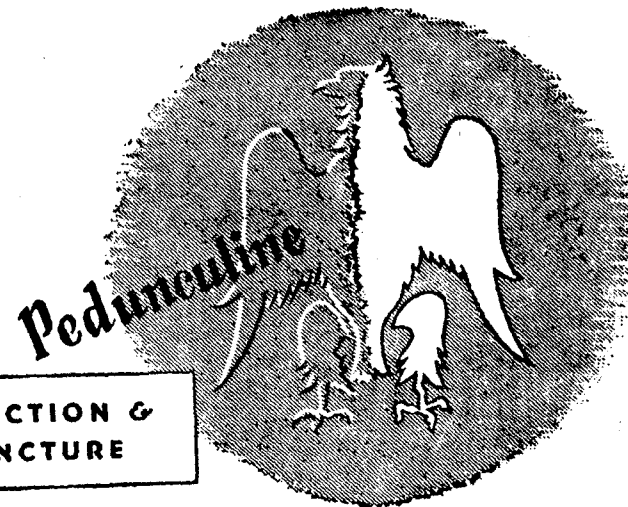
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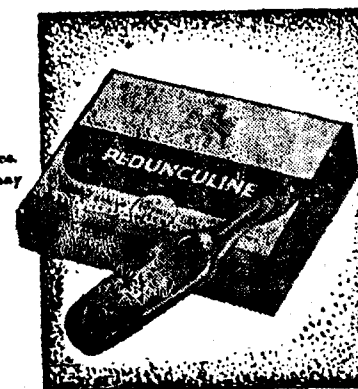
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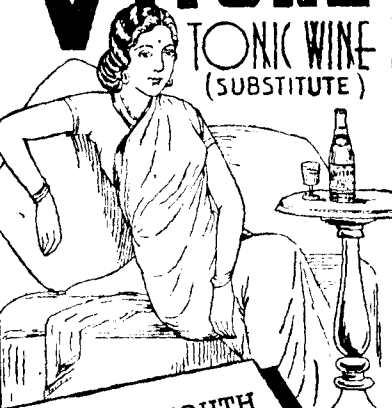


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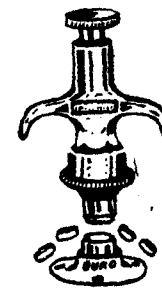
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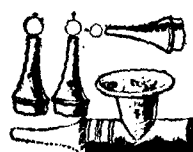
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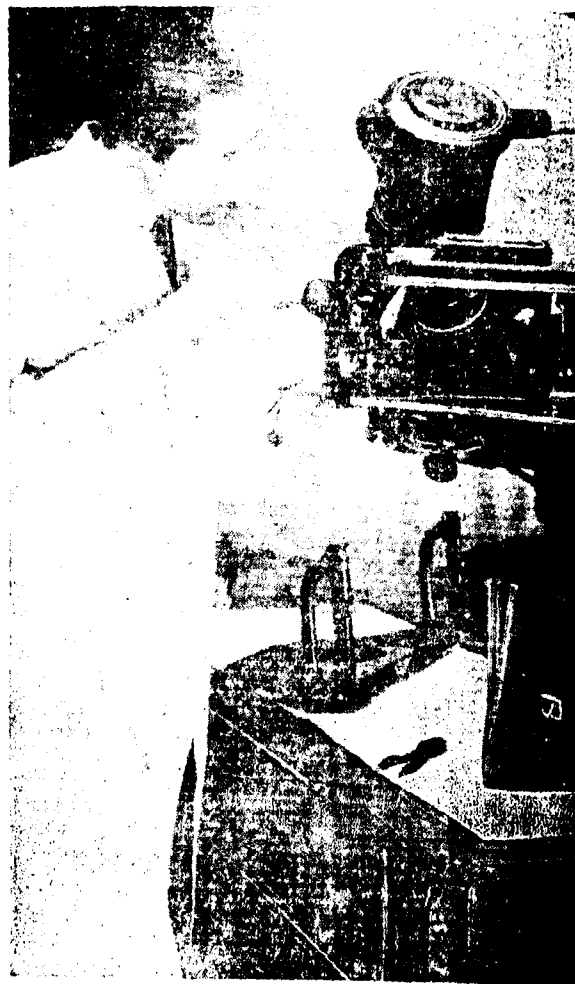
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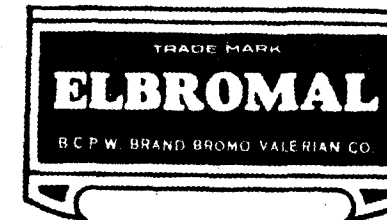
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