

VOL III

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Medical Journal

Surgeon

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Feb. 1934

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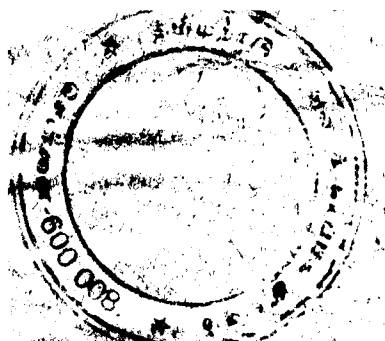
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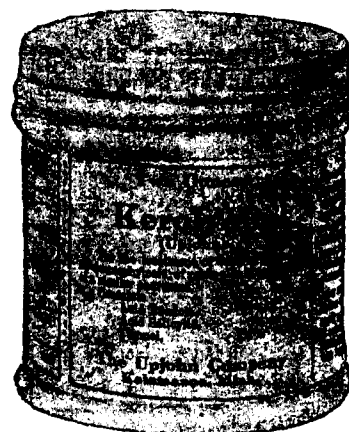
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A MONTHLY JOURNAL OF PRACTICAL MEDICINE & SURGERY

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MEDICO-SURGICAL SUGGESTIONS

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Original Articles

ESSENTIAL HYPERTENSION

By K. G. KRISHNASWAMI, M. B., B. S.

Madras.

The term essential hypertension, adopted by Sir Thomas Lewis, may be defined as chronic permanent raised blood-pressure of unknown etiology. It is not intended to include under this heading cases of raised pressure which are of transitory character such as those due to temporary emotional disturbances, nor those which can be definitely attributed to well defined morbid changes in the body, as in chronic nephritis. The intimate relation borne by diseases of the kidney to hypertension was recorded as early as 1836 by Richard Bright, at a time when the modern method of determination of blood-pressure by auscultation was unknown. It will be realised that this idiopathic hypertension signifies only a symptom rather than a well defined disease entity.

The clinical characteristics of this syndrome are rather complex since in a good percentage of cases attention is drawn to it only after the onset of certain complications, or during the course of a routine examination of the patient. It is because of this tendency to remain in a latent form for a considerable number of years that we find it difficult to state exactly the particular age at which the syndrome develops. Apart from this latency, the common early symptoms of hypertension can be interpreted in terms of either excessive action of the heart or an over-vigorous circulation through the viscera. A third feature, namely, depression of function due to disordered circulation develops later. Foremost among the former are palpitation, dyspnoea, cardiac pain, or discomfort in the chest. As a result of vigorous circulation, headache, throbbing sensations, insomnia, irritability, and haemorrhages in various parts of the body (epistaxis, haemoptysis etc.) appear.

As the case develops, we could classify the disorder under one of three types, depending on the system which is dominantly involved.

1. Cardiac type.
2. Renal type.
3. Cerebral type.

CARDIAC TYPE.

The commonest mode of fatal termination is myocardial insufficiency. It has been aptly described by Hay that "the normal termination of a case of persistent hypertension is cardiac defeat." The increased peripheral resistance which is present in hypertension necessitates a work-hypertrophy of the heart in order to maintain an efficient systemic circulation. Careful physical examination at this stage may reveal a full stony pulse of prolonged duration, raised blood-pressure, "thrusting" apex-beat, enlarged area of cardiac dullness especially to the left side, prolonged low pitched and muffled mitral first sound and accentuated aortic second sound. The pulse rate is apt to be lower than normal. In fact, one of the best indications of essential hypertension is evidences of hypertrophy of the heart without any ascertainable cause and this may be found as a useful diagnostic point in doubtful cases presenting vague symptoms.

The symptoms due to overaction of the heart, previously referred to, are exaggerated and become more definite and less evanescent. The pulse rate which was rather slow, tends to be accelerated, and irregularities of rhythm become frequent. Diffuse apex beat, gallop rhythm and cyanosis become manifest and ultimately the myocardial insufficiency leads to a fatal termination in one of two ways: congestive cardiac failure or original type of failure. The former expression signifies extensive venous stasis and increased capillary pressure with the result that functional inefficiency of the various organs and tissue oedema develop. The blood-pressure begins to fall when the heart begins to fail and if the patient is examined at this stage one is likely to miss the primary disease since the blood-pressure may be normal or even lower. At this stage clinical distinction between primary hypertension with secondary heart failure and myocardial insufficiency due to cardiac or renal diseases is often very difficult. The valuable diagnostic points are the presence or absence of organic cardiac murmurs, and tests of renal efficiency.

Sometimes the end is brought about with very little evidence either of venous congestion or oedema. Sudden death may occur without any clinical details in the first attack as in the case of Dr. Arnold or it may be preceded by one or more attacks of cardiac pain. The so called cardiac pain is felt across the chest or at the sternum, often extending into the arm. There are two main types, but the specific pain differs only in intensity and their pathogenesis has a common factor in myocardial ischaemia—a theory first formulated by Allan Burns in 1809.

i. In some cases the pain is of short duration and depends on exertion—"Angina of effort."

ii. In others the pain is not related to exertion and is prolonged—"Angina of decubitus." It must be remembered, however, that between these two types all grades may be met with. The first variety of this distressing symptom arises from ischaemia of the cardiac muscle which is relative and intermittent, and is due to either

localised spasm of the coronary artery or narrowing of these vessels due to atheromatous changes; whereas the second type is usually complicated with coronary thrombosis and the pain arises from the resulting necrotic ischaemia which is absolute and permanent. Atheroma of the coronary artery with or without thrombosis is frequently met with in the autopsy room in cases of hypertension. When there is co-existent atheroma of the coronary vessels the nutrition of the heart muscle is markedly impaired and the hypertrophy may not be marked enough to attract our attention to the true nature of the condition. It is rather interesting to note that the terminal arterioles of the coronary vessels are left untouched especially when we remember the importance of the changes in the arterioles of the kidney in the study of the renal pathology in hypertension.

RENAL TYPE.

This group includes all those cases where the terminal effect is brought about by renal insufficiency. Fabr referred to this group as "Malignant hypertension", and this was described by him as occurring in young persons. There seems to be no reason why this should be called malignant as contrasted with the other two modes of fatal termination.

It is a remarkable feature of essential hypertension that only a very low percentage of cases (about 8 per cent) end in renal failure. The reason for this becomes evident when we make a detailed study of the kidneys in this syndrome. The characteristic feature as compared with the changes that occur in the coronary vessels is that the terminal arterioles are almost always affected. Hyaline thickening of the intima of the renal arterioles is the essential lesion in this condition and is termed arteriolosclerosis, and was recognized by Bright himself as occurring in chronic nephritis. Even though this arteriolosclerosis is only an expression of hypertension, whether essential or nephritic, the changes are present in practically every case of essential hypertension (Fishberg, 100 per cent.) As a result of this arteriolar narrowing and occlusion, the corresponding glomeruli are thrown out of action and undergo atrophic shrinkage and sclerosis. This kidney of essential hypertension is also called the arteriolosclerotic kidney and must be distinguished from the arteriolosclerotic kidney where the lesion is the result of generalised arteriosclerosis affecting the renal artery and its branches. But the important fact to remember is that all these changes are focal and not diffuse, with the result that a fair amount of kidney substance is still left for carrying on efficient function and this accounts for the relatively low incidence of uraemia in this syndrome. "Benign nephrosclerosis", is the term used to describe such kidneys. This stage of the disease has been referred to by Mahomed as "the pre-albuminuric stage of Bright disease."

Not all cases of essential hypertension are so happily benign so far as the kidney is concerned. The onset of uraemia may be either slow

and insidious, or acute. In the insidious type of cases the changes in the small arterioles of the kidney are essentially the same as those described as benign nephrosclerosis, but differs only in the degree and extent, with the result that the kidneys show gross shrinkage and granularity. But the anatomic changes which occur in the acute cases differ from the ordinary forms. Necrosis of the afferent glomerular arterioles is the prime lesion in such cases and as this is a rapid process, there is little time for atrophy and sclerosis to occur with the result that microscopically the kidneys show little or no gross atrophy. The resulting glomerular infarction gives rise to the appearance of flea-bitten kidneys of subacute bacterial endocarditis, on account of the haemorrhages which occur into the capsular space. Such a type of kidney is called "Malignant nephrosclerosis."

Clinically serious renal involvement is suggested by the following features:—Impaired tests of renal efficiency, symptoms of uraemia, albuminuria in the absence of cardiac decompensation, albuminuric retinitis. According to Keith, marked retinal lesions are indicative of serious renal involvement.

This stage of the disease differs clinically from chronic interstitial nephritis with its associated hypertension in the following features:—

1. Age.—In nephrosclerosis the patient's age is usually from 40 to 55, while chronic nephritis affects younger people.

2. Anaemia.—Though it is a common experience that many persons suffering from chronic nephritis are anaemic, in primary hypertension it is just the opposite. In fact, the high degree of congestion of the cutaneous blood vessels may give rise to a robust appearance.

3. History of haematuria.—History of haematuria can be elicited in a certain proportion of cases of chronic nephritis since they start as acute nephritis.

4. History of oedema.—Oedema, if it occurs in essential hypertension is a result either of cardiac or renal complications, whereas it will be a prominent factor in the history of those chronic nephritics who have passed through a hydraemic stage.

5. Degree of cardiac hypertrophy and blood-pressure.—Both the cardiac hypertrophy and the blood-pressure are more marked in essential hypertension than in chronic nephritis. A blood-pressure of 250 mm. of mercury and above are common in hypertension while rare in nephritis.

6. Urinary changes.—While albuminuria is generally noticed in chronic nephritis, it is inconstant in hypertensive subjects. In these latter cases, hyaline casts alone are seen in the urine generally, while granular casts and R. B. Cs. are few. In the former, both hyaline and granular casts are common, often with a good number of R. B. Cs.

Differentiation between these two conditions in spite of these points may be found really difficult in some cases.

CEREBRAL TYPE.

In the study of cerebral pathology in essential hypertension, much attention is usually paid to the characteristic sudden onset of massive intra-cerebral haemorrhage and the comparatively ingravescent onset of cerebral thrombosis. Besides these, there are some acute cerebral symptoms in hypertension, which have been termed "hypertensive encephalopathy" by Fishberg and "hypertensive cerebral attacks" by others. The factors in the production of cerebral symptoms are enumerated below:

1. *Angiospasm*.—In persons subject to chronic hypertension, sudden rise of blood-pressure induces spasm of the cerebral vessels. It will be realised how an arteriosclerotic vessel can undergo spasm as compared with an atheromatous vessel. In the former the changes which occur in the arterioles are firstly hyperplastic thickening of intima and hypertrophy of the media, later degenerative changes and fibrosis take place. From this it is obvious that before the last stages of fibrosis the changes in the vessel wall will not materially interfere with its contractility.

The symptoms due to angiospasm consist of attacks of temporary aphasia, paresis; disturbances of vision are likely to occur if the spasm affects a branch of the posterior cerebral vessels which supply the occipital lobe. Fits of Jacksonian type may occur as a result of local anaemia of a small area of motor cortex, but if the opposite cortical area is also affected consciousness is usually lost.

2. *Cerebral oedema*.—In some individuals the cerebral capillaries seem unable to adjust to rapid rise in pressure and cerebral oedema results. The dominant symptom in these cases is the sudden appearance of severe headache often accompanied by vomiting. Rarely coma is present even though drowsiness is fairly common. Ophthalmoscopic examination will reveal retinal exudates, haemorrhage and papilloedema. The cerebrospinal fluid is under high pressure as shown by a lumbar puncture. Albuminuria is fairly constant. If proper treatment is not done, death may occur as a result of medullary compression.

3. *Cerebral haemorrhage*.—As the two factors necessary for spontaneous intracerebral haemorrhage, namely arterial degeneration and high blood pressure, are present in essential hypertension, this catastrophe is a common terminal event. The vessels which are particularly liable to be affected are the lenticulo-striate and the lenticulo-optic branches of the middle cerebral artery. The next most common site is the white matter of the centrum ovale, from the branches of the anterior cerebral artery. The blood effused, if large in quantity, tears up the cerebral tissue, destroys the basal ganglia and internal capsule and may burst through the optic thalamus into the lateral ventricle. From there it flows by the aqueduct of Sylvius into the fourth ventricle. Such cases are rapidly fatal. In cases which have lasted a few days and in which

the amount of blood effused is small, a clot is formed and presses on the sound cerebral tissue; the hemisphere in which it has taken place is enlarged. After some time secondary oedema of the affected hemisphere may occur and further increase the size of the brain. This increase of intracranial pressure, if uniform, will produce a further rise of blood-pressure if the vasomotor mechanism is intact. The sudden loss of consciousness is apparently due to the profound anaemia from compression of the capillaries which accompanies any large haemorrhage, and the subsequent coma is to be attributed to the oedema which develops secondarily. Lumbar puncture will reveal frank blood intimately mixed with the fluid only when the haemorrhage reaches the ventricle or the subarachnoid space.

4. *Encephalomalacia*.—This term signifies softening of the brain as a result of thrombotic occlusion of the supplying vessel. The occurrence of fatty degeneration of the thickened intima of the arterioles may lead to great reduction of the lumen and thrombosis. The immediate effect of the thrombus is a condition of infarct with oedema and it is this oedema which causes the loss of consciousness so commonly seen a few hours after. The oedema passes off in a few days and the area bereft of circulation by the thrombosis tends to become narrowed by collateral circulation and accounts for the partial recovery from the symptoms. The cerebrospinal fluid is never found to contain blood, but some time after the thrombosis, it is often coloured yellow from escape of blood pigments when the lesion has reached the surface of the convexity or the surface of the ventricle. Thrombosis tends to occur when the blood-pressure is low and the circulation is less active, and hence the danger of indiscriminate lowering of the pressure in a high tension subject.

TREATMENT.

It is obvious that the treatment of this syndrome must be to a large extent symptomatic since the etiology is uncertain. Rest, both physical and mental, is of enormous value in the management of these cases. Absolute rest in bed will have to be insisted on, especially when there are evidences of cardiac failure or prodromal symptoms of apoplexy. The heart's action, whenever weak, must be supported by the diffusible stimulants such as alcohol, strychnine, etc. It is not advisable to resort to drugs which act by diminishing the force of cardiac action to lower the blood-pressure. Experiences with drugs such as sodium nitrite, erythrol tetranitrate, and nitroglycerine which act by causing dilatation of blood vessels, are disappointing. Sudden reduction of the blood-pressure will be disastrous and hence only those drugs which have a slow and prolonged action must be used. Another drug which has been used extensively is iodide even though there were conflicting opinions regarding its efficacy. The use of thyroid extract, hippurates and benzoates have been advocated by some authorities. Saline purgatives to effect a slight

laxative action of the bowels daily, and the use of some mercurial preparation (blue pill) once a week at bed time are certainly useful. Regulation of diet in the early cases, with limitation of the number and bulk of meals together with restriction of proteins and meat extractives, is of great value.

If cerebral symptoms appear, careful nursing and attention to the condition of the bladder and rectum are quite essential. Lumbar puncture will relieve some of the symptoms due to high intracranial pressure. It is advisable to withdraw all the fluid which will run out at a rate above the normal.

Case Reports

A CASE OF FAUCIAL DIPHTHERIA

By M. R. BAIL, L. M. S.

*Honorary Assistant Surgeon, Ear-Nose-Throat Department,
General Hospital, Madras.*

An elderly gentleman brought his ten year old grandson to my consulting room for fever. The boy had been treated previously by a physician for "an ordinary cold with fever" with soda salicylas and tincture of belladonna mixture. The temperature had kept on at 102 degrees in spite of this treatment and there was slight stiffness of the neck, but the boy was playing about all the same.

On examination on the 14th March, the boy never looked ill, but his temperature was 102, pulse 140, the tongue was coated, swelling and tenderness at the angles of the lower jaw was present, and there was sore-throat. Careful examination of the throat with the aid of the frontal mirror showed both the tonsils to be fully covered by a thick whitish membrane extending right up to the uvula, painful and bleeding on attempting to remove a portion of the membrane—the typical text-book picture of faucial diphtheria. There was no difficulty in diagnosing diphtheria in such a case, but still a throat swab was taken for microscopical examination, when the typical Klebs-Loeffler bacilli were found together with pneumococci, the most common and sometimes the most troublesome companion.

Anti-diphtheretic serum, 10,000 units, (Bengal Immunity) was given hypodermically mixed with 5 minims of adrenalin to avoid any serum reaction. Next in importance is to support the heart. Plenty of glucose was administered, a teaspoonful every 2 hours, either in milk or in barley water or soda water. Perfect rest in bed and isolation in a well-ventilated room, were enforced, and the importance of these measures was duly explained to the boy's grandfather. Besides these, there was no other treatment. The next day the temperature was 101 degrees, pulse 120, and nothing untoward happened, but calomel and soda bicarb was given to correct the tendency to constipation, and 10,000 units of serum injected. On the 16th, the temperature was

100, pulse 120, the bowels moving free, and the general condition very satisfactory. There was an appreciable decrease in the pain, tenderness, and swelling in the submaxillary region; on examining the throat, the tonsils were found to be almost clear, except for a small whitish patch over the uvula. Another injection of 8,000 units of anti-diphtheretic serum was given, and another of 7,000 units on the 17th. On the 18th, calomel was repeated and 5,000 units of serum given, making a total of 40,000 units in all. The temperature was ranging between 99 and 100 degrees, the throat having come to its normal condition by this time. A thorough examination of the chest was made, but there were no pulmonary signs, not even a cough. A mixture containing tincture ferri perchlor, liquor hydrargyri perchlor and liquor strychnine hydrochlor was given for two days, and also anti-streptococcus serum, but the temperature remained at 99 or 100 degrees. A slight cough was then noticed, with a few rales just medial to the apex of the left scapula. A mixture containing creosote was given for a week, the temperature slowly coming down after the third day, though it did not actually touch the normal. Eventually the mixture was stopped and the usual food allowed, but rest in bed was continued. Three days later the cough stopped completely, the rales disappeared altogether, the temperature came down to normal and continued to remain so. The boy was in bed for a week more. Of course, the hygiene of the throat and mouth was carefully maintained throughout the treatment.

The case reported above shows the importance of an early and careful diagnosis of sore-throat, the very prompt and liberal treatment required, and the efficiency and reliability of Indian-made sera. It will also be noted that the most commonly dreaded complications due to the diphtheria toxin affecting the heart and the nervous system were not noticed even to the slightest degree, evidently due to early recognition and immediate administration of anti-toxin, and partly at least to the rigorous rest in bed for a pretty long period, even after the cessation of symptoms.

Book Review

JOURNAL OF THE MADURA MEDICAL ASSOCIATION.

A quarterly journal published by the Secretary of the Madura Medical Association. Annual Subscription: Rs. 2; free to members.

We have received some of the issues of this journal started late last year, for recording the activities of the Association and to stimulate the members to write scientific articles and reports of interesting cases. These objects have been carried out successfully in the issues published so far. We wish the journal a long and useful career.

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MEDICO-SURGICAL SUGGESTIONS.

FEBRUARY 1934

HYPERVITAMINOSIS D.

The modern craze for vitamins in diet has led to indiscriminate use of medicaments and foods alleged to contain these vitamins. It is recognised that only very small quantities of vitamins are required to ward off the deficiency diseases. But it has been found that in the routine administration of vitamin D in the form of irradiated ergosterol, an excessive dose gives rise to a train of symptoms which have been designated hypervitaminosis D.

It is well known that vitamin D causes an increased absorption of calcium or phosphate from the intestine. The level of phosphate and calcium in the blood rise and the surplus of calcium phosphate is precipitated out into the bone. The amount of calcium in bone thus depends upon the amount of calcium and phosphorus in the blood, and if the blood-phosphate and calcium can be kept at the right optimum level, sufficient bone salt is laid down. In deficiency of vitamin D, there is excessive loss of phosphate or calcium in the faeces, a low blood-phosphate, and sometimes a low blood-calcium, all of which culminate in inadequate deposition of calcium salts in bone. This is the phenomenon noted in rickets. In hypervitaminosis D, the picture is reversed; there is increased absorption, with hypercalcaemia or hyper-phosphataemia, and an excessive degree of calcification.

The amount of vitamin D required for prophylactic treatment of rickets is 1000 to 3000 international units, and the maximum curative dose is 5000 international units per day in a child of one or two years. The latter dose is equivalent to 0.5 mgms. of ordinary solid irradiated ergosterol, or 15 tea-spoonfuls of good cod liver oil. Though this dose is considered the maximum for cure, up to 10,000 units have been given, which is certainly on the verge of hypervitaminosis. Hypervitaminosis D, however, is less likely to occur in the curative treatment than in the preventive treatment of rickets.

The toxic effects of hypervitaminosis D have been studied in rats, and much of the knowledge on this subject in the present day is due to the persistent study of J. L. Harris of the Medical Research Council's Nutritional Laboratory at the University of Cambridge. Before his time, it was thought that the lesions were due to toxic impurities in the ergosterol administered, and to an increase of basal metabolism. Harris found that rats fed on the so-called "rachitogenic diets," consisting of high calcium and low phosphorus content, rapidly developed fatal hypervitaminosis if excessive vitamin D was added. Rats fed on diets containing a constant known excess of irradiated ergosterol with graded allowances of calcium phosphate were found to manifest an accentuation of the ill-effects of excessive vitamin D by an increase of calcium phosphate. Harris showed that the condition of hypervitaminosis D is characterised by a raised blood-phosphorus or blood-calcium, with excessive calcification of the growing ends of bone and calcification of certain soft tissues. There is also an unusual excretion of calcium salts in the urine. Such toxic effects have also been recorded in human subjects. Babies receiving 2 to 5 mgms. a day of irradiated ergosterol have manifested symptoms, but in some cases very high doses have not resulted in any deleterious effects. A case has been reported where 2.5 mgms. a day has caused symptoms. A case of calcification of the kidney with a fatal termination has been reported.

Thus in view of the great risk involved, it is best to avoid concentrated preparations of vitamin D. Misuse of the drug is the common lot of most of the modern products placed in the market, but a strict adherence to the instructions, and insistence on the dose being marked in international units instead of in drops, will eliminate most of these risks. One may argue that the danger of hypervitaminosis is practically non-existent, but it is apparent that the optimum curative dose is dangerously close to the toxic dose.

Incidentally by way of digression, the other vitamins have not been known to cause any harmful effects when administered in excess. With excessive vitamin A, toxic symptoms have been seen in rats, consisting of loss of weight, loss of hair, inflammation of the eyes, exophthalmos, fragility of bones with spontaneous fractures, all symptoms suggesting a condition of hypercholesterolaemia. But in human subjects there is no possibility of any danger in the use of excessive doses of vitamin A, as the dose should be very large.

Medical News and Notes

The Earthquake in Bihar. On the 15th January and after, Bihar has been the scene of very severe earthquake and devastation, resulting in several deaths and injuries and rendering the population destitute and homeless. Money and men have been pouring into Bihar from all over India and even from some foreign countries in an effort to reconstruct what were once flourishing cities and villages. The medical relief work readily undertaken by the Indian Medical Association is really commendable.

Golden Jubilee of the Bombay Medical Union.—The golden jubilee of this premier medical association of Bombay, which has a membership of more than 300, was celebrated on the 21st January under the presidentship of Dr. A.S. Erulkar, M.D. Dr. J. J. Cursetji, M.D., the only surviving member of the three founders of the Union (the other two being the late Dr. B.S. Shroff and Dr. D B. Master) delivered the jubilee oration, tracing the growth and progress of the Union during the last fifty years. The oration was followed by a dinner. Among the guests were the Chief Justice, the Vice-Chancellor of the University of Bombay, the Mayor of Bombay, the Sheriff of Bombay, and Dr. Sir Temulji Nariman. The Bombay Medical Union has our best wishes on the completion of fifty years of its career and many happy returns of several more Jubilees.

Chettinad Medical Association. A meeting of this association was held on the 20th January at Dr. Shetty's Hospital, Kanadukathan, with Dr. N.C. Appayya, L.R.C.P., M.R.C.S., in the chair. Dr. T. Krishna Menon, M.B., C.M., L.R.C.P., M.R.C.S., Honorary Physician, Madras General Hospital, delivered a lecture on "thyrotoxicosis." Drs. T. S. Shetty and S. Subramaniam spoke about some interesting cases. Dr. Shetty was "at home" to the members and guests. The meeting terminated with a vote of thanks proposed by Dr. K. Narayanasami Iyer, District Medical Officer of Ramnad.

Registered Medical Practitioners' Association, Nandyal. The second annual meeting of this association was held on the 20th January in the Municipal Council Hall with Dr. P. Venkatanarayana, L.M.S. in the chair. Dr. S. Ramadas, L.R.C.P., M.R.C.S., L.M.S.S.A., and Dr. B. Sukhavanam were elected President and Secretary respectively for the year 1934. Dr. Subramaniam described the working of medical associations in western countries and mentioned some of the disadvantages of affiliating an Association with another body. After tea, Dr. Hyamans De Tiel delivered a lecture on "pain in gynaecology" and Dr. S. Ramadas on "gonorrhoea and its treatment."

Madura Medical Association. A clinical meeting of the above association was held on the 22nd January when Dr. N. Isaac of Tirumangalam read a paper on "tobacco and its medical aspects," and Dr. M.N. Rajan, M.B., B.S. demonstrated a case of "general lymphadenitis."

The sixth annual meeting of the same association was held at the District Medical Officer's bungalow at Tallakulam on the 9th February. Mrs. and Major P. Verdon, I. M. S., the President, were at "home." Colonel Sir Frank Connor, I.M.S., Surgeon-General with the Government of Madras, was also present. After a group photograph and tea, the members were introduced to the Surgeon General. After a few remarks from the President, the sixth annual report of the association was presented by the Secretary, Dr. A. Narayana Menon, M.B., B.S. The report showed that there were 46 resident members and 7 non-resident members on its rolls, that the association was running a quarterly journal for recording its activities, and that the finances were satisfactory. The Surgeon-General congratulated the association on its useful activities. The meeting terminated after the election of office bearers.

Coimbatore Medical Association. Under the auspices of this association, Dr. S.A. Keller of the United States of America delivered a lecture on "Otitis Media" on the 26th January.

Chittoor District Medical Association. A meeting of the above association was held on the 29th January at the Government Headquarter Hospital, Chittoor, with Dr. S. Padmanabha Sarma, M.B., C.M., District Medical Officer, in the chair. Dr. K. C. Paul, M.D., Honorary Physician of the Royapuram Hospital, Madras, delivered a lecture on "the treatment of diabetes." Dr. Sarma was "at home" to the members of the association.

Tenali Medical Association.—The first anniversary of the above association was celebrated on the 28th January with Dr. R. Venkata Rao, M.B., B.S., Civil Assistant Surgeon of Gudivada in the chair. The programme included music and variety entertainment, and enactment of a scene from "Kanyasulkam." Dr. G. V. Subba Rao read a paper on "sublethal medication in intestinal stricture", and Dr. V. Suryanarayana read a paper on "the medical profession."

Salem District Medical Association.—The second annual meeting of the above association was held on the 4th February at the bungalow of the District Medical Officer at Hastampatti, Salem. Lt. Col. N. K. Bal, I.M.S., M.C., District Medical Officer, presided. After tea, the annual report was read by Dr. K. Ramanathan, L.M.S., secretary. There were 27 city members and 35 mofussil members on the association's rolls, and a sum of Rs. 750 had been collected towards the building fund. The following office-bearers were unanimously elected for the year 1934:—President: Lt. Col. N. K. Bal, I.M.S. Secretary and Treasurer: Dr. B. Rajaratnam; Joint Secretary Dr. S. Krishnamurthy Rao; Members of the Executive Committee: Dr. O. C. Madhavan, Miss. A. D'Cruz, K. Ramanathan, and P. S. Ramaswami; Auditor: Dr. S. Sundaravaradachari. The president, in the course of his concluding remarks, congratulated the members on the progress during the preceding year and exhorted them to take an abiding interest in the association. Music and games in the evening and dinner at night formed a pleasant finale to a thoroughly entertaining function.

East Godavari District Medical Association. On the occasion of the second anniversary of this association held on the 20th January, reported in our last month's issue, the following office-bearers were elected for the year 1934:—President: Major T. S. S. Shastri, I.M.S., Secretaries: Drs. V. C. Kamaraju and P. Audinarayanaswamy; other members of the Managing Committee: Drs. S. Swamy Naidu, B.S.S. Prasada Rao, and Miss. T. E. Stephens. The annual report for the year 1933 showed a membership of 157, and a splendid record of work done, thanks to the persuasive personality of the president, Major Shastri.

A meeting of the same association was held at the Board High School, Samalkota on the 10th February, with Major T. S. S. Shastri, I.M.S., District Medical Officer, in the chair. Dr. B. S. S. Prasada Rao of Samalkot and other members of the locality were "at home" to the members. A number of interesting cases of groin glands, joint swellings and thickened bones were exhibited from the Government Headquarter Hospital, Cocanada, and a discussion ensued on the diagnosis of those cases. Major A. Krishnamurthy, B.A., M.B., C.M., A.I. R.O., of Rajahmundry spoke on some features of syphilitic affections, as distinguished from tubercular and other affections, of bones and glands. Dr. Prasada Rao exhibited a case of "want of growth" in a child of five years looking like one of two years. Dr. V. C. Kamaraju, L.M.S., of Cocanada read out detailed notes of a case of fever, swelling on the right side of the abdomen, and discharge of a large amount of pus from the bowel, which finally proved fatal. Major Shastri delivered a lecture on "head injuries." The meeting terminated after music and dinner.

Vizagapatam Independent Medical Practitioners' Club. A meeting of the above association was recently held at the consulting rooms of Dr. M. V. Krishna Rao, B.A., M.B., B.S., who was also "at home" to the members. Dr. P. Rama Rao and Dr. M. V. Krishna Rao were elected president and secretary respectively for the current year.

The fourth Andhra Medical Conference. The fourth Andhra Medical Conference is to be held this year at Bezwada on the 30th and 31st March 1934. Members of the profession are earnestly requested to contribute to the success of the conference by attending as delegates and by sending papers containing original ideas bearing on modern medicine and surgery and on new methods of treatment. Clinical demonstrations are also solicited. Papers should reach the secretaries before the 10th March. The delegate fee is rupees two, which may be sent in advance to the treasurer or paid at the conference. All the doctors in the Kistna District are specially requested to enrol themselves as members of the Reception Committee and help to make the conference a success. It is hoped, through your co-operation, that the conference may be able to advance the progress of scientific medicine and promote the interests of the profession by decisions arrived at the conference.

An exhibition of medical and surgical appliances and drugs is being held in connection with the conference on the same dates. As a large number

of mental defect, inheritance is a contributory factor, though in many instances unfavourable environment is also a cause. They consider that besides mental illness, sterilisation should also apply to blindness, deaf-mutism and haemophilia. From the experiences in America, the committee state that legislation has been really effective in those States in which sterilisation has been worked on a voluntary and not on a compulsory basis. The committee find no evidence of mental or physical deterioration as a sequel to sterilisation, nor is it likely to be followed by increased venereal disease. The recent German experiences in eugenic sterilisation were not helpful to the committee, as they were under exceptional circumstances. The committee were well impressed with the injustice of refusing sterilisation to those who have good grounds for fearing that they may transmit mental defect or disorder and who are unfitted for parenthood, as sterilisation constitutes the only effective means of escaping from a burden which they have every reason to dread.

"Clinical Science".—The Harveian Oration before the Royal College of Physicians of London was delivered by Sir Thomas Lewis on the 18th October 1933 and published in the *British Medical Journal* and the *Lancet* of the 21st October, besides other Journals. (This incidentally shows that there is no journalistic monopoly of public medical lectures in England). Sir Thomas said that "clinical science" is a much a pure science, to be studied for its own sake, as any other form of science. He wants to see not so much a closer union between the laboratory and bedside workers as the development of a group of investigators capable of studying the Patient and carrying out the necessary laboratory work themselves without depending on others. He maintained that the final proof of efficiency of a drug must rest essentially on the test in patients and one of the important tasks in clinical science in the future is to compile records of properly controlled observations of the effect of various remedies. The oration was very encouraging to the clinical worker, who, in the words of Alan Moncrieff, was beginning to develop an inferiority complex as a result of the spectacular discoveries of so many laboratory workers.

Obituary. We regret to record the death of Dr. H. B. Mylvaganam, F.R.C.S., (Eng.) Retired Senior Surgeon of Mysore.

Correction. In the January 1934 issue of this Journal, page 17, line 20 from the bottom, for "*Indian Medical Journal*" read "*Indian Medical Gazette*."

Special Article

RECENT ADVANCES IN THE TROPICAL DISEASES OF INDIA

By A. VISWANATHAN, L.M.P., Madras.

FILARIASIS (Contd.)

I suggested and carried out a blood examination and to my great surprise and to that of the Surgeon, the blood showed microfilaria. An "opening dose" on the fifth day made him completely normal. The pain disappeared and the lump more gradually and orchitis was completely absent on the seventh day.

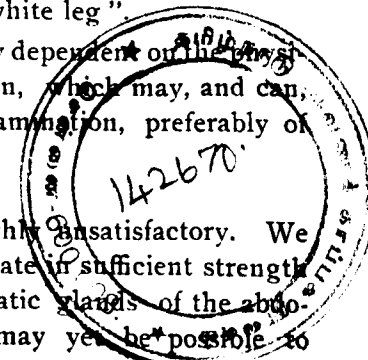
The diagnosis then, in such obscure cases should be cautiously made. It is fortunate, however, that in such cases, microfilaria are usually found in the peripheral blood.

Swellings of the scalp, of the face, and of the lips are never caused by filariasis, as indeed it will be obvious if one understands the pathology of filarial infection. All hydroceles and chyluria need not be of filarial origin. These may be brought about by simple and bacterial inflammation or by mechanical obstruction. Dermatolysis can be made out by the pendulous folds of the skin and should not be mistaken for filarial obstruction. It is due to the soft fibromatous growth formed by an overgrowth of the perineural sheaths of the nerve fibres supplying the subcutaneous tissues and corium. Surgical removal of the deep lymphatic glands, say of the axilla or groin, may give rise to elephantoid swellings of the limbs. Hypopituitarism may closely simulate filarial elephantiasis, but there is an association of stunted growth or excessive adiposity in this condition. Sometimes streptococcal infection as in puerperal sepsis may travel from a cervical tear along the lymphatics of the broad ligament to the pelvic lymphatic glands, causing unilateral or bilateral oedema of one or both legs, commonly known as "white leg".

Thus the diagnosis of filariasis is entirely dependent on the physician's common sense and his clinical acumen, which may, and can, in some cases, be verified by microscopic examination, preferably of the nocturnal blood.

TREATMENT.

The treatment of filariasis is thoroughly unsatisfactory. We have yet to find a drug which can penetrate in sufficient strength to kill the adult filaria into the deep lymphatic glands of the abdomen. In these days of chemotherapy it may yet be possible to



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discover the specific at no distant date. For the present, surgical treatment is the treatment of choice for elephantiasis of the scrotum, lymph varix, enlarged glands, cysts and abscesses and hydrocele of filarial origin. For cellulitis and lymphangitis, which is invariably due to the superimposition of bacterial infection, auto-vaccines or even stock vaccines of *staphylococci* and *streptococci* are of decided usefulness and may abort or cure the infection. If the infection is severe, as is always the case with the *streptococci*, anti-streptococcus serum may save the patient's life. But, while the vaccines counteract the bacterial mischief, they have no effect on the elephantoid condition.

Rogers was the first to suggest, in 1920, the use of antimony tartrate and was inclined favourably towards it. My experience with it gave different results. Recently I tried 1 c. c. of a 2 per cent solution of sodium antimony tartrate in a case of filarial fever with recurrent abdominal colic and orchitis. It is now one year and a half and the patient has had no similar attack, which he was having twice or thrice a month before this treatment was instituted. In another case, a middle-aged woman, with pronounced elephantiasis of both the legs and with frequent bouts of fever, I gave a course of sulfarsenol, amounting to 2.25 grams in all, after which she was afebrile for a period of one year. Then there was a recurrence of fever but I chose to give a series of urea stibamine injections, totalling about 2 grams. The results were unsatisfactory and the patient positively preferred the former injection. Sir Frank Connor thinks that soamin may be useful. Chopra thinks that tryparsamide, injected intravenously in doses of 2 grams in 10 cc. of distilled water, produces disappearance of chyluria and decreases the frequency of the attacks of lymphangitis. Sherwani (1932) reports a case of chyluria having been cured by injections of neostibosan. Acton and Sundar Rao (1929) published their studies on the treatment of filariasis using different drugs with known parasitocidal effects, basing the microfilaria rate as the gauge of their efficacy and any amelioration of the clinical symptoms. They frankly acknowledge that the reduction of the microfilaria rate is no true criterion of the efficacy of the drug chosen for treatment, as its normal variations from zero to a high point are common enough. Yet, the drugs they tried have not caused any appreciable reduction of the already ascertained microfilaria rate in the particular patient or patients. Bisene, antimosan, stibosan, neostibosan, stiburea, novastiburia, antimony sulphur compound, mercurochrome, plasmochin, emetine, tryparsamide were tried by them. They conclude that the remarkable variations in the numbers

of microfilaria are quite independent of the drug administered and produce no effect whatsoever on the circulating microfilaria and presumably on the adult parasites, and that while tryparsamide has no destructive action on the microfilaria, it somehow produces disappearance of chyluria and diminution in the frequency of lymphangitic attacks.

Perhaps, the future of the filarial specific lies in some organic compound of arsenic.

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THE CHIEF EPIDEMIC DISEASES OF INDIA.

Of these, three are of importance: *Small-pox*, *Plague*, and *Cholera*. I do not intend to devote much space to the first two, as the recent researches on those diseases are few, scattered and far between, and from the utility point of view their value is at present negligible and have in no way given us specific methods of cure, though specific methods of protection have been evolved in lymph vaccination and in plague inoculation (with modified Haffkine's vaccine). Thanks, however, to Rogers' intensive studies and to other observers, a forecast of these epidemics can with reasonable certainty be made. These forecasts are important as they will enable the

public health authorities to mobilise their forces of preventive methods in proper time, either by way of specific prophylaxis on a mass scale or by such other sanitary measures as would militate against a rapid spread of the epidemic, if not its total prevention, or by both, if it were possible, and thus reduce the terrible mortality which these diseases have been claiming for centuries. The forecasts are made by the statistical studies of previous epidemics of the last one or two or more decades with reference to rainfall, temperature, humidity, absolute and relative; and in this study you will find that each of these epidemics require particular and definite atmospheric conditions for its epidemic spread, variations in its severity or otherwise depending on variations within the optimum favourable conditions. If this coincides with meteorological forecasts of the year, the prediction of the epidemic may come to happen and that this occurs with greater or lesser accuracy is proved by Rogers' early predictions coming true every time.

What are these definite atmospheric conditions which favour outbursts of these epidemics? Low relative humidity between 40 and 60, according to Russell, or low absolute humidity at about 0.700 to 0.800 according to Rogers, together with the failure of the monsoon rains and high temperature favour the incidence and spread of small-pox. High temperature and high saturation deficiencies are unfavourable to high subsequent plague incidence and *vice versa*. Low rainfall, resulting in the stagnation of water, with absolute humidity not below 0.400 and not above 0.600 favour epidemic spread of cholera. Absolute humidity below 0.400 or above 0.800—that is to say, very low or very high absolute humidity, inhibit the spread of these infections. These factors are not so simple as they look when reduced to writing. They are governed by variations of place, of altitude, and of the intensities of monsoon. India, though considered to be a tropical country, presents such vast climatic variations in its different parts and at different times of the season that what happens in one portion of the country is not applicable to any other part. Thus, if cholera breaks out in Bengal during April and May, it may be during January to May in Madras or May to July in the Punjab or August to December in the United Provinces, depending on the optimum favourable conditions in those latitudes. This reminds me of an English peer who was travelling on foot from Rangoon to China and who packed off all his warm clothing to Hongkong to await his arrival there with the idea that it was not necessary in a tropical climate like India and Burma. He reached a place in the Southern Shan States, 4000 feet above the sea level where I

was in charge of a civil dispensary, in the winter of December Shivering with cold he came to my dispensary for a loan of at least some warm blankets and exclaimed "Damn these books on geography! Tropics are hot, they say. I am misled and have sent by steamer all my warm clothing to await me at Hongkong". I burst into laughter in which he heartily joined and swore that in future he would read geography, *cum grano salis*. That is the climate of India. There is no uniformity and therefore these epidemics prevail in varying periods in different provinces and even districts. A forecast of an epidemic applicable to Bengal is not applicable to the Punjab or to Madras and each must be done with reference to conditions likely to prevail in that particular province.

We have, however, no control over these climatic conditions and like King Canute, cannot attempt to reverse or alter them with the hope of eradicating these diseases from our country or any other country. They give us timely warning, and it is up to us to arm ourselves against the impending ravages. To do this successfully a thorough knowledge of their etiology and of the specific methods of prophylaxis and treatment are necessary.

SMALL-POX.

The causal organism of small-pox is still shrouded in mystery. Many have isolated different kinds of cocci but none seem to be connected with the specific production of small-pox. That it may be a filtrable ultramicroscopic virus is the conclusion which is at present reached on the strength of analogy; that it has got life and possesses particular properties seems to be clear; that it cannot be successfully cultivated except in the presence of living tissue cells may indicate its potential danger to man—all these are knowledge gained, incomplete as they are. The modes of infection with these filtrable viruses differ from each other. Yellow fever and dengue are caused by mosquito bite; rabies is conveyed by dog bite and by the bite of other animals; small-pox and influenza are said to be air-borne, infection occurring by inhalation. Their pathological manifestations are also equally divergent. The virus of rabies attacks the central nervous system; the viruses of measles, chicken-pox and small-pox attack the epithelium of the skin, though between themselves there are great variations. Even from the point of view of active immunity, their characteristics differ. Thus the exanthmata of small-pox, measles and chicken-pox confer an almost complete and permanent immunity—not so with influenza or dengue. All these remain to be further investigated.

The lightning rapidity with which small-pox spreads is said to be in favour of air-borne infection. The scabs of small-pox are said to be particularly infective. There are only two known methods of protection against the spread of this diseases, namely, strict isolation of the patient, and vaccination. The first is not possible without the co-operation of the public and we all know how difficult it is to get it in this country. They have not as yet totally given up the theory of the goddess of small-pox. The second is compulsorily enforced on the public by the government and in spite of carping critics, it can be safely said that vaccination and re-vaccination once in 6 years offers a safe protective against small-pox. That sometimes small-pox affects even the vaccinated is well known and is probably due to the virulence of the epidemic, or more probably, to the extreme susceptibility of the individual or to both. These exceptions cannot reasonably be used against vaccination as it has done the largest good for the largest number. Ideal results—especially in medicine—do not seem to be possible in this very human world.

The diagnosis of small-pox from chicken-pox is sometimes very difficult and in doubtful cases it is safer to treat it as small-pox. The diagnostic point I would like to stress is the time of appearance of eruptions—in chicken-pox it appears invariably at the end of a day's fever, whereas in small-pox it appears not less than two days after the fever.

The treatment of small-pox is entirely symptomatic—attention to bowels, and skin sanitation. It is a matter of deep regret that no specific treatment has been possible so far, and there is no serious attempt made to discover one. The odore of Madras finds that an injection of 10 cc. of 1 in 500 solution of potassium permanganate tends to abort successful vaccination in rabbits and therefore suggests that it may be useful in the treatment of small-pox. The injection is not followed by any untoward symptoms. Masilamani of the Madras Isolation Hospital tried it in 1927 in 3 cases and seems to be impressed favourably. Fresh crops of vesicles are aborted, the old ones dry quickly and the secondary rise of temperature is prevented. It is a disease that was known in pre-historic times and has been responsible for a great amount of human mortality; like a volcano it flares up, destroys, and then disappears, only to reappear after some period; yet no systematic attempts are made for the discovery of a remedy that will abort, if not completely cure the disease. Perchance, in its successful prevention lies the hope of its eradication.

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PLAGUE.

Plague is essentially a disease of rats, sometimes of squirrels, and is conveyed to man by means of rat fleas and, it is said by some, by means of bug bites (which seems to be improbable). Though well-known and prevalent in other countries for a long time, it was first introduced into India in the year 1896, at the port of Bombay, from where and from which time it has spread throughout this land and has established definitely its endemic centres with periodical epidemic exacerbations. No wonder. Rats, defectively constructed houses with thatches, tiles and wood, and the existence of fleas, in other words, a susceptible animal, a proved vector and a favourable environment are sufficient for *Bacillus Pestis* to work its havoc upon men. "Kill the rats and build rat-proof houses" has been the slogan of many public authorities in India. They are easier said than done. Rats will try to live just as men do; a defectively built house is the lot of common men. Would it be possible to do away with the vector, the rat flea? It is fond of the blood of rodents; but when the rats die of plague, it skips to man to bite him and thus infects him. We are thus in a vicious cycle and hence the importance of anti-plague inoculation. That it has saved many lives is undoubted but unfortunately, unlike vaccination for small-pox, the immunity it confers is short lived and has to be repeated whenever necessary. Attempts are now being made to improve the plague vaccine at the Haffkine Institute at Bombay and it is hoped they will succeed in evolving a potent vaccine with good keeping qualities, and if I may venture to suggest, the quantity to be injected should not be more than 1 or 2 cc., as a larger quantity causes much pain by pressure effects and is also not easy to give hypodermically. Haffkine's plague prophylactic, as manufactured at Bombay is a broth culture of highly virulent plague bacilli grown for a period of 6-8 weeks in the dark and sterilized by heat. It is composed of the culture medium together with the bacillary bodies and the products of their metabolism. The usual immunising dose is 4 cc. When injected the immunity is developed quickly reaching its maximum within 3 to 5 days. Different brews of the vaccine, sometimes, differ in their potency and they have been recently standardised before issuing to the public. The anti-plague vaccine manufactured in Germany, France and England is prepared from plague cultures grown on a solid medium for 2 or 3 days, washed with saline, sterilized by heat or antiseptics and standardised by the counting of the dead bacilli, and contain only the bacillary bodies without products of their metabolism, as in Haffkine's plague vaccine. It

has been tested at the Haffkine Institute, Bombay and found that its immunising properties are comparatively less than the Indian made vaccine. Recently Avari of the same Institute has succeeded in isolating a strain of bacteriophage from rats which brings about the lysis of a culture of plague in less than two hours and this "anti-pes-tiphage" has been found on experiment to possess some protective value. But it is as yet too premature to draw definite conclusions.

Table showing immunising value of Haffkine's anti-plague vaccine. (*Naidu and Jung*).

		Popula- tion.	No. of attacks.	Ratio per 100.	No. of deaths.	Ratio per 100.	Percen- tage survi- vors.
Bombay.							
1897-1900 ...	Un-inocu- lated.	3,227,842	59668	1.8	50735	1.5	14.9
1902-1916 ...	Inoculated.	1,937,213	4126	0.21	1620	0.08	60.7
Madras.							
1926 ...	Un-inocu- lated.	2,132	26	1.2	21	0.99	19.2
	Inoculated.	19,328	62	0.32	13	0.07	79.0

I shall mention some of my own figures regarding the efficacy of anti-plague inoculation. In a central jail in Burma, with a population of 1800 prisoners inoculation was performed on all the prisoners immediately after the first case occurred in the civil area. The epidemic in the town was fortunately not severe and the mortality was much below 20 per cent. There was not a single case of plague among the inmates of the jail and no rat mortality within its precincts. The might have been due to the isolated and distant situation of the jail and to the mild nature of the epidemic as much as to the prophylactic inoculation. But one cannot easily guess what would have happened if the prisoners were not inoculated, especially as the jailors and warders lived outside the jail and frequented the city daily in spite of restrictions imposed upon them. Yet another but a more conclusive instance. In another jail I noticed a dead rat on the pavement of the female convict ward and without ever seriously suspecting plague but for curiosity's sake, took a smear from the spleen, stained and put it under the microscope. To my great astonishment I found the characteristic plague bacilli and not believing myself had it verified by my civil surgeon. Before we thought of anti-plague measures, the next day a female convict fell severely ill with high fever, no enlargement of glands, but with pronounced symptoms of toxæmia.

(To be continued).

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" " Bitter Orange	...	"	7.50
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" " Aconite	...	"	0.05
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Diuretics and their uses.

D. MURRAY LYON.

(*British Medical Journal*. 1933. ii. 853)

Diuresis is an increased flow of urine without regard to the composition of the fluid or its source. Diuresis may merely represent an increased intake of water by the mouth or it may depend on removal of fluid from the tissues. Regulation of the flow of urine depends on many factors among which are water balance and the state of nutrition. The water intake includes not only the fluids imbibed but the water content of foods and the water which is formed as an end product of metabolism. Fluids are removed from the body by several channels in addition to the urine, namely the skin, lungs, and faeces. Moreover, carbohydrates in food favour water storage, while fats release fluid from the system; when a subject is changed from a rich carbohydrate low fat diet to one with high fat and little carbohydrate, extra water is rapidly lost from the body, amounting to about three or four litres in the first few days. A converse change of diet results in a rapid increase in weight which can only be interpreted as retention of fluid in the body. Diets which are grossly under-nutritional may result in the development of hunger oedema. Increased alkalinity within clinical limits tends to favour water retention, while acids lead to diuresis. At one time sodium chloride retention was believed to be the most important cause of water retention (oedema), but it is not so. It is quite possible that in nephritis the main difficulty may lie in the sodium metabolism. The acid producing chlorides of calcium and of ammonium have diuretic properties, and potassium, chloride may replace the corresponding sodium salt without causing oedema. It is interesting to observe that among the saline substances empirically recommended as diuretics sodium salts are practically never mentioned.

Most reputed diuretics act readily enough in health while the heart and the kidneys are normal, but few are reliable in disease.

Digitalis and strophanthus: In cardiac failure with oedema, corrective measures are first directed mainly to the state of the heart muscle, and no special attention is paid to the oliguria or the oedema. Digitalis is usually believed to exert its diuretic effects solely through the circulation, strengthening the heart and restoring the normal pressure relationships in the vessels; digitalis is not diuretic in the normal, nor in the absence of circulatory failure. Ordinary small therapeutic doses have no special effect on the blood vessels, but large massive doses constrict the blood vessels, including those of the kidneys, thus accounting for the preliminary reduction of urinary output in about ten per cent of the cases. Digitalis may be a useful diuretic in the later stages of renal failure, and also in nutritional and anaemic oedemas where the circulation is impaired. Strophanthus has similar action on the heart rate as digitalis, but lasts a shorter time and results in less diuresis.

The xanthine series: When severe cardiac oedema fails to respond to full digitalization, other drugs should be tried singly or in combination. The specific diuretics of the xanthine series act by direct stimulation of the renal tissues, but unlike other diuretics, they call for work on the part of the kidneys. They cause vaso-dilatation of the kidney vessels. In health they are powerful diuretics. Compounds of theobromine and of theophylline

are commonly employed but they tend to cause gastric upset and renal damage. The popularity of theobromine and sodium salicylate probably depends on the happy choice of its synonym. Theophylline and sodium acetate is said to be more powerful and to be less liable to upset the patient. Euphylline (theophylline and ethylenediamine) is non-irritant, and possesses a more powerful action in dilating the coronary vessels, easily soluble, and can be given orally, rectally or intramuscularly. Drugs of this class should be used with caution as they may damage the kidneys in renal oedemas. If diuresis occurs it does so within 24 hours of their use, but on the whole these drugs are disappointing.

Urea is a normal constituent of urine, a non-threshold substance, and forms the greater proportion of the end-products of nitrogen metabolism. It is a safe natural diuretic, and large quantities can be readily excreted without harm to the kidney, except where there is nitrogen retention. Given in doses of 10 to 15 grams urea usually produces a very considerable diuresis within a few hours, but as it is rapidly excreted the effect is of short duration, and repeated administration is required to keep up the diuresis. It is efficient in cardiac oedema after full digitalization, and in chronic oedematous nephritis. The bad taste is a drawback of the drug.

Salts: Saline diuretics absorbed into the blood are excreted by the kidneys, and through osmotic action in the urine they prevent reabsorption of water by the tubules. The saline diuretics most frequently employed are the citrates and acetates of potassium and ammonium; the organic fraction of these becomes converted in the body into carbonate, so that these neutral salts raise the alkali reserve of the blood and tend to make the urine alkaline, and the ammonia fraction may be finally changed to urea. They are of no use in cardiac oedema. In chronic forms of nephritis alkalis are beneficial in reducing the blood nitrogen and lessening albuminuria and haematuria. Osman recommends, in acute nephritis, a mixture of alkalis which is increased gradually until the patient is taking 1000 grains of the mixture daily; for a time oedema continues to increase and then diuresis suddenly sets in. The use of acids and acid-ash diets for producing diuresis in nephritic oedema is hardly one that commends itself, but in cardiac failure and in hepatic cases this mechanism may be taken advantage of without detriment. Sodium acid phosphate does not readily change the pH of the urine, but adequate doses of the neutral salts, the chlorides of calcium or ammonium can induce considerable acidosis and diuresis.

Water Diuresis: In health, water is probably the most efficient diuretic. Water as a diuretic finds its greatest use in infections and in local lesions of the urinary tract, and in fevers and intoxications. In oedematous nephritis water is safe only when the salt intake is limited.

Mercurials: Calomel has a reputation as an occasional adjuvant in resisting cardiac oedemas. It can be given in repeated minute doses in order to obtain the renal effect without causing diarrhoea; doses of $\frac{1}{4}$ to $\frac{1}{2}$ gr. in every half or one hour are given to a maximum of 2 or 3 grains, but this procedure sometimes fails. Among the organic mercurials, novasurol and salyrgan are most employed. Both are efficient and dependable, and have to be given intramuscularly. Salyrgan is free from the mercurialism sometimes observed with the former. An injection sometimes doubles the urinary output. These drugs should be avoided in renal cases, but used only in cardiac cases. Preliminary digitalization or administration of ammonium chloride for three days, results in a better response while using the mercurials.

Hormones: Pituitary possesses both diuretic and anti-diuretic properties, and is only employed in urinary suppression. Thyroid is very useful in producing diuresis in long standing renal oedema and obesity, but is contraindicated in circulatory failure.

Colloids: Certain oedemas appear to depend on reduction of plasma proteins, with consequent fall in the oncotic pressure of the blood. Intravenous gum-saline solution relieves these cases, and sometimes blood transfusion may be necessary.

Decapsulation is suggested in cases of chronic parenchymatous nephritis where the tubular tissues may remain so swollen that the urinary passages are compressed and a mechanical obstruction is caused.

Diets: In cardiac cases a dry diet is helpful in diminishing oedema. A salt-poor diet is essential in the control of any dropsy. Low protein diets are satisfactory for acute nephritis but should not be continued for long, lest there should be lowering of the plasma proteins. But when there is no evidence of nitrogen retention and the oedema is chronic, a normal or high protein diet is of greater benefit. A diet which yields an alkaline-ash is advised in chronic nephritis.

For inflammatory oedemas and serous effusions diuretics are of little or no value.

Viruses in relation to the practice of medicine

J. M. RIVERS.

(*Pennsylvania Medical Journal* 1933. xxxvi. 489.)

Viruses are smaller than ordinary infectious agents and are either invisible or difficultly visible under the best microscopes. They have never been shown to be capable of multiplication on lifeless laboratory media. Inclusion bodies are frequently produced by them or by their activities in the cytoplasm or in the nucleus of infected cells. Viruses act directly on cells, stimulating their multiplication or causing their destruction. Finally, virus infections, as a rule, lead to a lasting immunity in recovered hosts. These facts emphasize the intimate type of parasitism exhibited by viruses, living or dead, and serve to separate virus maladies from those caused by other and better known infectious agents.

When they attack their hosts, these highly parasitic agents multiply on or in susceptible cells and cause symptoms and signs of disease only when they come in contact with such cells. If the action of the viruses is not extremely rapid and explosive and if the susceptible cells are capable of multiplication, the primary effect of the active agents is stimulation leading to cellular hyperplasia. Following the hyperplasia there is usually a destruction or necrosis of the cells, which in turn is attended or followed by a secondary inflammation. The balance between the stimulative and destructive tendencies of the viruses determines whether hyperplasia or necrosis is the predominant part of the pathologic picture. Thus, in some virus diseases such as vaccinia, varicella, small pox and herpes simplex vesicles occur; in others such as warts and tumours, an overgrowth of tissue is the prominent feature. When vaccinia, small pox, and fowl pox are mentioned, one usually visualizes vesicles and pustules, but in these maladies a hyperplasia of cells precedes the formation of vesicles. If the action of the viruses is explosive or rapid, as in yellow fever, or if the susceptible cells are incapable of dividing and multiplying as in the case with nerve cells, then

the primary pathologic changes are necrobiosis and lysis of cells or the appearance within the cellular elements of inclusion bodies.

The following are some of the virus diseases commonly encountered :

Neoplastic diseases : The excessive stimulation of cells seen in some virus diseases leads one by analogy to think of malignant neoplasms. Though a number of fowl tumours are caused by agents separable from cells, there is no proof that mammalian tumours arise in this way. The fact that some tumours are produced by filtrable viruses is by no means conclusive evidence that all neoplasms arise through the activity of such incitants.

Bacteriophagy : Bacteriophagy is a transmissible disease of bacteria. The striking phenomenon of the dissolution of bacteria in test tubes by the action of bacteriophages has naturally induced physicians to use the lytic principles in the treatment of diseases like cholera, dysentery, sepsis, pyelitis and furunculosis. Though the results obtained are conflicting, the one obvious fact is that the phages do not lyse bacteria in the presence of colloidal materials encountered by them in the body. Reports concerning the treatment of boils by means of staphylococcus phage are encouraging but, since the bacteria causing the boils are not lysed by the bacteriophage, the explanation of this form of treatment remains to be determined. Bacteriophages active against streptococci, staphylococci and coli bacilli have been given intravenously in cases of sepsis, but this manner of administration of lytic principles is dangerous and should not be practised until further knowledge is obtained. Generally speaking, the phages so far have been a disappointment as therapeutic agents.

Varicella : This is a mild disease, but one of the most contagious infections known, and patients with the malady probably become infectious 24 to 48 hours before the appearance of the rash and cease to be a source of danger to susceptible individuals for 8 days after the advent of the eruption. However, it is not an easy matter to transmit the disease from man to man by means of dermal inoculation with vesicle fluid, though the virus is present in the vesicles. The virus is extremely labile and there is no evidence that the dried scabs are a source of danger. Convalescent serum administered to patients in amounts of 10 cc. within the first few days after exposure to infection usually prevents the disease and individuals protected in this manner become susceptible again after several weeks. No specific therapy is known once the infection has established itself.

Herpes simplex or fever blisters frequently accompany common colds, pneumonia, malaria, cerebrospinal meningitis and other diseases. Herpes simplex is one of the few virus diseases in man that does not lead to a lasting immunity, repeated attacks occurring in the same individual.

Herpes zoster : The pathologic changes observed in zoster lesions are similar to those seen in herpes simplex and varicella and the lesions from these diseases cannot be diagnosed from each other by the microscope. They all show acidophilic inclusion bodies in the nuclei of the affected cells. Zoster appears to induce immunity in recovered patients as the disease occurs only once in the same individual. Zoster virus is not pathogenic for lower animals. Viruses tend to localise in irritated or injured tissues and chicken pox and zoster conform to this rule. The primary localisation of the virus in herpes zoster may occur either in the nerve ganglia or on the skin. Most cases of zoster are produced by a virus differing from that of fever blisters and chicken pox. Occasional cases of varicella and herpes simplex

may have an eruption localised in such a manner as to simulate the picture of zoster.

Measles : Cases of measles are infectious during the 4 or 5 days before the appearance of the rash, and cease to be so 5 or 6 days after the advent of the eruption. Convalescent measles serum, given in 5 to 10 cc. amounts during the first 6 days after exposure, is efficacious in preventing an attack of the disease, but the immunity lasts only a few weeks. Serum given between the 6th day after exposure and the beginning of the period of invasion is incapable of preventing the malady but decreases its severity; but if given during the period of invasion or after the appearance of the eruption the course of the disease is uninfluenced. If convalescent serum is not available serum from adults who have had measles in childhood may be used. Large quantities of this serum, 15 to 20 cc. must be used.

Yellow fever : In nature, yellow fever, a virus disease, is spread by mosquitoes; in the laboratory, workers may contract the malady without the aid of the insect vector, the inciting agent probably entering the body through the mucous membrane of the upper respiratory tract. The etiologic agent, after repeated passage through mice by means of intracerebral inoculations, loses much of its virulence for man and monkeys. The mouse brain virus mixed with appropriate amounts of human convalescent serum constitutes an efficient means of immunization of laboratory workers. Convalescent yellow fever serum prevents experimental infection but the administration of the serum after the onset of the disease apparently has no effect on the course of the malady.

Psittacosis is a disease of parrots and birds of the parrot family, easily transmissible to man. The virus abundant in the nasal discharges of infected birds, enters man through the upper respiratory tract and attacks the lungs, the resulting pneumonia being usually one of signs without symptoms. The virus is in the sputum. Convalescent serum is of no value and there is no specific therapy.

Small pox and vaccinia : Small-pox virus passed through monkeys, then through rabbits, and finally through a number of calves ceases to be small pox virus and becomes vaccine virus which causes an inoculable but not a contagious disease of human beings. Vaccination with cowpox virus protects man against small pox, as vaccinia has a shorter incubation period than has small pox and is able to set into motion the forces of immunity with great rapidity.

Rabies : The incubation period of rabies is usually long enough to enable persons bitten by rabid animals to be protected against the disease by means of vaccines prepared from fixed virus. But once the symptoms have developed, specific anti-serums are valueless.

Epidemic encephalitis : The cause of this condition is unknown; there is no actual proof that the disease is infectious, but there is evidence in favour of the idea that it is caused by a filtrable virus. At present there is no specific therapy worthy of consideration.

Acute disseminated encephalomyelitis : Following many of the virus diseases, such as vaccinia, small pox and measles, an acute disseminated encephalomyelitis characterized by perivascular demyelination occurs in rare instances. For the treatment of these encephalitides the use of convalescent serum has been suggested, but it is of no use. The etiology of these encephalitides is unknown.

Poliomyelitis is one of the best examples of a virus disease. For a long time poliomyelitis usually meant paralysis, but now workers believe that numerous cases occur in which no evidence of involvement of the central nervous system can be found. Such unrecognized cases account for the fact that approximately 80 per cent of the adult population is refractory to poliomyelitis, as determined by the presence in the blood stream of neutralizing antibodies for the virus. This disease also is not appreciably influenced by the administration of potent anti-serum after the onset of symptoms and signs of infection. But convalescent serum may serve as an excellent prophylactic agent. Thus, physicians should whenever possible, administer intramuscularly either convalescent serum or the pooled serum from several adults to all individuals who have been in contact with cases of poliomyelitis and to all cases of minor illnesses, particularly among children, occurring during epidemic periods.

Precancerous lesions of the skin

G. C. ANDREWS AND R. J. KELLY.

(*American Medicine*. 1933. xxxix. Special section on Dermatology No. 22. 2.)

Numerous conditions are known to have been the underlying cause of skin cancer, and the skin affections discussed below are those precancerous dermatoses most often encountered by the physician in general practice.

In the majority of instances skin cancer does not arise directly from previously normal epithelium; generally there has been a local disturbance at the point of origin and this usually has been of long duration. Hence, a history of repeated exposures to certain physical agents—light, x-rays, radium rays, heat and cold—may reveal much to the examiner. Mechanical trauma, single or often repeated, may have similar results and, not frequently wounds containing foreign bodies may give rise to cancer. The internal administration of arsenic may lead to epidermal proliferation which produces keratoses of the palms and soles with possible resultant squamous cell carcinoma. The continued exposure to tar, soot, lubricating oil, paraffin, and other hydrocarbons may cause erythematous, itching macules, pigmentation, and keratoses, which ultimately become cancerous. Chronic irritation from projecting or carious teeth, habitual smoking, or syphilitic lesions of the mouth may give rise to cancer of the tongue and lips, the latter being particularly prevalent among inveterate pipe smokers. The areas affected by chronic inflammatory diseases of the skin, such as lupus vulgaris and lupus erythematosus, are frequently sites of the development of carcinoma; the treatment of these diseases by x-rays, radium, and caustics increases the likelihood of carcinomatous changes. The lesions of, syphilis, blastomycosis, leukoplakia, chronic fissures, sinuses and fistulae likewise are at times the sites of development of cancer. Warts, moles, cysts, and other excrescences may undergo malignant degenerative changes with the formation of melanocarcinoma in the case of moles and squamous-cell epithelioma in the others. The tendency of epithelioma to develop on certain pre-existing diseases of the skin has led to the recognition of the following conditions as precancerous dermatoses: burns, chronic actinic dermatitis (sailors' and farmers' skin), Roentgen and radium dermatitis, xeroderma pigmentatum, keratoses (seborrhoeic, arsenical, Darier's disease etc.), verrucae (vulgaris, acuminata), leukoplakia, papillomata, corns, naevi, cysts, chronic ulcers, chronic fissures, Paget's disease and Bowen's disease, syphilis, blastomycosis, and occupational dermatitis.

● Patients presenting chronically inflamed dermatoses should have these affections thoroughly and quickly investigated. Long continued topical treatment of these conditions frequently has resulted in the occurrence of skin cancer which otherwise might well have been prevented.

Early recognition and prompt and adequate treatment make the objective cure much easier. Frequently it is not possible to diagnose clinically, and a histological examination is useful; biopsy thus confirms clinical diagnosis without delay.

Surgical removal of the lesions is the method of choice, particularly since at the same time it provides a specimen for pathological examination. However, since 25 per cent of skin cancers occur on or near the nose, while numerous others appear on the ears, surgery in these locations, unless at the hands of skilful plastic surgeons, usually leads to unsightly scarring. For this reason, thorough treatment with x-rays or radium is much to be preferred.

Cardiospasm: its diagnosis and treatment

HERMAN J. MOERSCH

(*Annals of Surgery*. 1933. xcvi. 232)

Cardiospasm is a persistent fusiform narrowing of the lower end of the oesophagus with obstruction and dilatation. The symptom-complex in cardiospasm is as a rule almost pathognomonic. The course of the disease may be divided into three stages: cardiospasm without regurgitation of food, cardiospasm with immediate regurgitation of food, and cardiospasm with dilated oesophagus (the retention of food being in the dilated portion and regurgitating at irregular intervals). The onset of cardiospasm is usually insidious. Dysphagia is the prominent and the first symptom, and is usually intermittent. It first manifests itself by a sense of lagging and later actual obstruction under the lower end of the sternum, sometimes referred to a point high in the throat. The impediment at first may be noticeable only when the patient is under emotional strain or has swallowed too rapidly; with time, the difficulty increases and becomes more pronounced. The dysphagia is likely to occur during the first portion of the meal. At first the obstruction may be overcome by swallowing several times in rapid succession or by taking several swallows of water in rapid succession and washing the food on into the stomach. With increased obstruction, such simple measures are insufficient, and the patient soon learns to swallow several glasses of water in rapid succession, take a deep breath, close the glottis and compress the thorax, thus increasing the intrathoracic pressure above the normal and forcing the food on into the stomach, regurgitating the remainder of the fluid. Cardiospasm can be readily distinguished from other forms of oesophageal obstruction by the duration of symptoms and the fact that cold liquids usually give as much difficulty as solid food; ice-cold drinks and such solid boluses of food as raw apples are probably the greatest offenders and most conducive to trouble. Gradually, the oesophagus dilates above the point of obstruction. When dilatation has occurred, the first portion of the meal passes into the stomach, whereas the remainder is regurgitated or remains stagnant in the oesophagus. The oesophagus may also lengthen in cases of cardiospasm and by kinking will lead to increased dysphagia and stagnation. Because of the increased obstruction and retention there is increased necessity to swallow continuously, and considerable time must be spent over a meal. With

restriction of diet and increase of obstruction, death will result if treatment is not instituted. Pain is sometimes a prominent symptom, varying in intensity from a slight discomfort under the lower end of the sternum to severe colic in the same region or radiating to the back or up into the neck. Less frequent symptoms are hiccup and dyspnoea; the latter is a result of the hugely dilated and filled oesophagus causing interference with respiration.

Diagnosis is confirmed by roentgenological examination. The passage of a No. 45 French sound over a previously swallowed silk thread elicits an elastic feel at the cardia with usually slightly more obstruction than normal, but the sound passes readily into the stomach. Oesophagoscopy should be done if in doubt but is not as helpful in cardiospasm as in other diseases of the oesophagus.

Various measures have been advocated in the treatment of cardiospasm, varying from palliative to operative. Palliative measures such as fluid diet, effervescent drinks, bromides and atropine may afford temporary help. Relief at times may be secured by passage of stomach tubes and sounds; in some instances gastrostomy is resorted to. The foregoing procedures are not usually effectual and something more drastic must be used. Mechanical dilators have been used. Other surgical procedures such as anastomosis between the abdominal oesophagus and stomach, and the longitudinal incision through the muscular wall of the abdominal oesophagus have been advocated. Although some of the procedures have afforded satisfactory results, the operation is usually attended by a high degree of risk, with the added disadvantage of frequent recurrence and failure completely to relieve the symptoms.

In the Mayo Clinic, extensive use has been made of the rubber-covered silk balloon, advocated by Russel and later modified by Plummer, who used water as the dilating medium. All dilatations are carried out over a previously swallowed silk thread held taut, which eliminates all danger of perforation. The thread is started 24 hours before dilatation and at least five yards should be ingested. Twisted silk is preferable to braided silk, and the thread is swallowed very slowly, about a foot an hour; the patient is permitted to partake of food during this period. In the rare instances in which there is marked oesophageal obstruction, several shots may be attached to the end of the thread to facilitate passing down to the cardia and into the stomach by gravity; the use of atropine may also be tried in conjunction with the foregoing procedure. If complete obstruction of the oesophagus exists and the above measures fail, the end of the thread with the shot attached can be dropped into the stomach by means of the oesophagoscope. It is well to lavage the oesophagus thoroughly before starting the thread, as solid particles of food which may interfere with passage of thread are removed. With the thread firmly anchored and used as a guide, a No. 41 French sound is passed to determine the approximate distance of the obstruction from the incisor teeth and to determine the character of the obstruction. This single procedure usually affords the patient some benefit, though rarely permanent. Formerly this procedure was followed directly with the hydrostatic dilator, but during the last six years, a No. 60 French sound has been passed first, to eliminate danger of perforation, and it affords complete relief of all symptoms. But as a rule further dilatation is necessary, and this is done a day or two later by means of the Plummer hydrostatic dilator.

In the Mayo Clinic, 71 per cent of the cases of cardiospasm in which dilatation was done, were completely relieved, and repetition of the dilatation was rarely necessary.

Among the reasons for failure to obtain satisfactory results from hydrostatic dilatation, the most common in failure to use a thread as a guide, the thread is absolutely essential to have the dilator directly in the cardia at the time of dilatation. When the dilator is in place properly, substernal pain is practically always present on dilatation. The dilating bag must be of proper size and shape to obtain satisfactory results; a water pressure of 18 to 24 feet of water will be sufficient, and this should be varied with the degree of dilatation present and the degree of discomfort produced.

Diaphragmatic Hernia

STUART W. HARRINGTON.

(*Journal of the American Medical Association*. 1933. ci. 987).

At the Mayo Clinic 30 cases of diaphragmatic hernia were recognized from 1900 to 1925 and 19 were operated on; from 1925 to 1933, 147 cases were recognized and 60 were operated on.

The condition is more common than the present records indicate, for a routine examination of the diaphragm in the course of other abdominal conditions has occasionally revealed a small hernia that had not been recognized clinically or roentgenologically before operation. Some of the unsatisfactory results from operative procedures, particularly those on the gall bladder, stomach, and appendix are due to unrecognized diaphragmatic hernia, usually of the para-oesophageal type. Recognition of a diaphragmatic hernia from clinical symptoms alone is often very difficult because of the complex symptomatology, which often simulates that of other organic disease of the abdomen and thorax.

The symptoms are complex because of the various structures which are often involved in the hernia and depend on the amount of mechanical interference with the function of the herniated viscera, on the degree of interference with normal function of the diaphragm, and on the amount of increase in pressure which the herniated viscera produce within the thorax causing impairment of circulation and respiration. Stricture of the oesophagus may be the result of a para-oesophageal diaphragmatic hernia, and may result from erosion of the oesophagus due to the trauma exerted by the herniated portion of the stomach. Oesophagoscopy is advisable in all cases of diaphragmatic hernia.

From a clinical standpoint diaphragmatic hernia may be divided into two main groups - non-traumatic and traumatic.

A non-traumatic diaphragmatic hernia may be congenital or acquired.

If congenital, the hernia is due to embryologic deficiency, usually without an enclosing sac. The most common sites in the probable order of frequency of occurrence are:

1. through the hiatus pleuroperitonealis (foramen of Bochdalek),
2. through the dome of the diaphragm,
3. through the oesophageal opening,
4. through the foramen of Morgagni, and
5. through the gap left by the absence of the left half of the diaphragm.

If acquired after birth, the sites of occurrence are:

1. through a point of embryologic fusion of the diaphragm,
2. at sites named under congenital types, and
3. through the oesophageal hiatus.

Traumatic diaphragmatic hernia may be caused by one of two types of injury:

1. Indirect injury to the diaphragm, the hernia occurring at any point, including points of embryologic fusion, but most commonly in the dome and the posterior half of the left side of the diaphragm; it is the result of a severe crushing injury and may or may not have a sac. When the hernia is through the oesophageal opening there is a sac, and when through the leaf of the diaphragm there is usually no sac.

2. Direct injury to the diaphragm, the hernia occurring at any point. It is usually the result of penetrating wounds such as those from a gunshot or a knife. Rupture of a subdiaphragmatic abscess, of lacerations from fractured ribs, may be the cause, and there is usually no sac.

The presence or absence of an enclosing hernial sac is of some practical, clinical, and surgical importance. A sac is usually not present in congenital hernia if there has been no loss of structure of the diaphragm or in traumatic hernias caused by direct or indirect injury. These are not true hernias but instances of evisceration of the abdominal organs; several abdominal viscera are involved and symptoms are very severe and urgent, and in surgical repair of these hernias a preliminary phrenicotomy and intratracheal anaesthesia are advisable. True hernias, those with a limiting sac, are most commonly para-oesophageal gastric, and most frequent in adults. The stomach is usually the only abdominal organ involved but the transverse colon may be drawn into the sac secondarily. These hernias do not enter the pleural cavity but are in the posterior mediastinum and are essentially sliding hernias, for the sac (the diaphragmatic peritoneum) is fused with the serosa of the gastric wall. The sac gradually enlarges as more of the stomach becomes drawn or forced into the posterior mediastinum and pushes out into both pleural cavities but behind the mediastinal pleura, being limited above by the pericardium and heart, on which the herniated, distended stomach often exerts marked pressure and is the cause of disturbed function, not uncommonly diagnosed as angina pectoris.

The clinical syndrome of diaphragmatic hernia can be divided into two main groups: those in which the stomach only is incorporated in the hernia (usually of the para-oesophageal gastric type), and those in which the stomach, large bowel and small bowel are included in the hernia, which is usually of the traumatic variety.

The symptoms of para-oesophageal gastric hernia are usually more uniform, extend over a longer period and are more often congenital. There may be a congenital weakness of the oesophageal ring and a definite hernia may be produced later by some injury or by increased intra-abdominal pressure such as obesity, pregnancy, or the strain of vomiting or severe exercise. The symptoms are of intermittent and progressive incarceration and obstruction of the stomach—epigastric distress during or after a heavy meal, usually relieved by belching or vomiting. Later, pain is more marked on left side of the spinal column. Pressure on the stomach interferes with belching or vomiting. Spasm of the diaphragm and reflex cardiospasm ensue, with the characteristic phrenic pain. Pressure on the lung and on the diaphragm causes dyspnoea. There is often an interval of weeks or months between attacks, but attacks are constant when the stomach is fixed in the thorax by adhesions. There is loss of weight from inability to retain food; haematemesis may occur and indicates severe incarceration of the stomach and may lead to ulceration. This is the complete course of a case of progressive herniation. In traumatic cases the symptoms are similar, but

of lesser duration. If the intestines are involved, signs of obstruction are present. The respiratory symptoms are usually more marked in traumatic cases.

Treatment: In para-oesophageal gastric hernia in which the stomach only is involved and symptoms are mild, the treatment may be conservative; but if symptoms are progressively severe, treatment should be surgical and operation should be performed before incarceration and obstruction have occurred. Cases in which the colon or small intestines are involved in the hernia demand early operation because of the danger of obstruction. Being traumatic in origin, these cases are best left alone till the acute symptoms caused by the injury have subsided, if the patient's condition will permit.

Preliminary paralysis of the diaphragm, either temporary or permanent by phrenicectomy is valuable in the surgical treatment of incarcerated and strangulated hernias, because it prevents spasm of the muscle and relaxes the hernial ring; it is also a palliative procedure in poor operative risks. The relaxation and elevation of the diaphragm following this procedure permit the hernial openings to be sutured around the lower part of the oesophagus, entirely above the herniated portion of the stomach. Phrenicotomy is not applicable to hernias in which a large portion of the stomach is in the thorax and in which the intestines are involved.

The author uses both the abdominal and the thoracic approach in reduction and repair of these hernias but prefers the former. The operative procedure consists of replacement of the herniated abdominal viscera and repair of the abnormal opening in the diaphragm. Adhesions have to be separated, the diaphragmatic defect repaired with fascia lata or chromic catgut. There were 5 deaths out of the 60 cases operated, with one recurrence.

Relation of trauma to rupture of hollow abdominal viscera

JEWETT V. REED.

(*Archives of Surgery*, 1933, xxvii, 216.)

Many patients who suffer from various diseases of the intra-abdominal organs attribute the onset of their trouble to a strain or other abdominal injury. Several cases of this kind have come under the author's observation, who, in an endeavour to investigate whether the laws of hydromechanics apply to the abdomen and its fluid contents, has made a series of observations in order to determine whether Pascal's law applies to the living abdominal cavity with its fluid-containing hollow viscera and also to determine the pressure relations in the abdominal cavity in those cases in which a true traumatic rupture of a viscus did occur.

Pascal's law states: "pressure applied from without to an enclosed fluid (liquids and gases) is transmitted equally in all directions without loss and acts with equal force on all surfaces". This law applies to fluids within a single enclosure. As no information could be found regarding the application of this law in enclosures subdivided into compartments by elastic membranes, the author studied the pressure relations in such a system of fluid containers by experiments with apparatus consisting of glass and rubber and then on living dogs, with the result that the law holds good. An increase in intra-abdominal pressure will cause an equal increase in the pressure in all of the hollow intra-abdominal organs, namely, the stomach, duodenum, small and large intestine, appendix, gallbladder and urinary

bladder, so long as their natural orifices remain closed. The wall of no hollow viscus can be ruptured by a simple increase in the intra-abdominal pressure, because the pressure on the visceral wall will be exactly equal on both sides.

But clinically it is known that hollow viscera do rupture under certain circumstances, and the causes of such ruptures, apart from penetrating wounds, may be grouped into three:

1. Diseases resulting in disintegration of the visceral wall, as in gangrene of the appendix, gangrene of a loop of bowel, a malignant growth on the wall of a viscus, and progressive necrosis and ulcerations, such as gastric and duodenal ulcers, tuberculous ulceration of the bowel and ulceration secondary to calculi. In all these conditions the rupture may be entirely spontaneous, or may be aggravated by peristaltic waves in the adjacent visceral wall, or be hastened by changes in pressure.

2. Overinflation or overdistension, as in fermentation and putrefaction. This is seldom seen unless the ruptured viscus is weakened by disease.

3. External violence to the abdomen, as in severe blows or compression as by the wheel of a vehicle.

An increase in intra-abdominal pressure such as is caused by muscle strains, coughing, sneezing, vomiting, pressure or blows over the abdomen, will cause rupture of an intra-abdominal hollow viscus provided this viscus is so distended that its walls reach the opposite sides of the abdominal cavity, and the blow, force, or compression is directed over the distended viscus. Thus, for rupture of the stomach, it must be distended so that it can be compressed between the anterior abdominal wall and the vertebral column or between the lateral surfaces of the abdomen, and the direction of the violence must be directly over the stomach. In the case of the small intestines the same holds true, except for that these tubes are often empty or are emptied by the abdominal force, in which case the intestines may be crushed between the anterior abdominal wall and the bodies of the vertebrae, similar to the crushing of a solid organ. The appendix, diseased or normal, is not affected by increase of intra-abdominal pressure unless there were a distended appendix superimposed by a mass of solid adhesions that extend to the anterior abdominal wall. In the case of external hernial sacs in the abdominal wall, an increase in the intra-abdominal pressure will tend to force abdominal contents into these empty sacs; but internal hernias cannot result from increased intra-abdominal pressure and loops of intestines, appendix, and other structures cannot be forced under bands or through apertures, according to Pascal's law.

Tumors of the Small Intestine

H. W. HUNDLING.

(*Journal of the Arkansas Medical Society*, 1933. xxxl. 43.)

The embryological, anatomical, and physiological differences between the small intestines, the stomach, and the large intestine, may account for the fact that the small intestine is relatively insusceptible to tumor formation, especially since it is comparatively free from stasis. Practically the only portion of the small intestine in which the faecal contents are brought to a standstill and accumulate is the terminal ileum, and since stasis is thought to be conducive to irritation, we may surmise the reason for the relative prevalence of tumors in this region.

The *etiology* of tumors of the small intestines, is unknown. Occasionally they are found in infants, but most frequently in adults between the ages of 25 and 40 years. Clinically, they are either submucous or subserous; many of them cause no symptoms and are discovered accidentally at autopsy. Those that develop beneath the mucosa may ulcerate through and cause intestinal haemorrhage or obstruction of the lumen. The subserous type may remain silent for a long period and then reach a palpable size. The tumors may be either intraluminal or extraluminal. The majority, especially the benign ones, are of the internal type and polypoid, but they may undergo secondary malignant changes. Many of these are adenomata and when they develop a pedicle and reach considerable size, may cause symptoms of obstruction. Sessile tumors may be found within the wall of the intestine, with a broad base, and usually loosely covered by mucous membrane. The malignant tumors usually extend rapidly either around the lumen or in a longitudinal direction, in some cases causing practically complete obliteration of the lumen.

Railford of the Johns Hopkins Hospital found that tumors of all types in the small intestine constituted 8.9 per cent of all gastro-intestinal tumors; benign tumors constituted 23.8 per cent of all benign tumors, and malignant tumors only 4.9 per cent of all malignant tumors of the gastro-intestinal tract. The most common tumors were of the lymphoblastoma group arising from lymphoid tissue as atypical cell types, and most of them were in the ileum. Since the duodenum is so frequently involved in ulceration it is interesting to note its role in tumor involvement. Among a series of six duodenal tumors, two were myomata, two adenomata, one adenomatous polyp, and one haemangioma. Congenital cysts have been found, and occasionally a pedunculated tumor is present which may be invaginated through the sphincter muscle into the stomach. King reported a series of 119 cases of benign tumors of the intestine, and of these 5 were in the duodenum (consisting of one fibroma, one lipoma, one telangiectatic tumor and two myomata) 8 in the jejunum, 23 in the ileum, 3 in the ileo-caecal region, one in the appendix, 22 in the colon, 36 in the rectum, and 11 undesignated in the small intestine.

Varieties: Adenomata are the most common benign tumors, and develop at the expense of the epithelial cells of the mucosa. They increase in frequency towards the lower part of the intestinal tract. Intestinal adenomata of the endometrial type occur with ectopic endometrial adenomata in about 10 to 20 per cent of women.

Polypi are more often multiple and are formed by glandular hyperplasia.

Angiomata arise principally in the submucosa and tend to invade the muscular coat. They may range from naevi to cavernous angiomata. Bleeding from an angioma may simulate duodenal ulcer. Most of the angiomata are situated in the jejunum and upper ileum.

Fibromata are found in patients of advanced age, commonly on the right side of the abdomen. They may become large enough to cause obstruction, and alternating diarrhoea and constipation are frequent symptoms.

Lymphoblastomata are more common in young persons than other malignant tumors, and are found most frequently in the terminal ileum as a constricting growth encircling the intestinal lumen. They do not metastasize as readily as carcinomata or sarcomata, but when they do, the adjacent mesenteric lymph nodes are chiefly involved.

Myomata are most common in the ileum in males about the age of 50, and usually undergo secondary changes.

Lipomata are either submucous, or less commonly, subserous. They should be thought of if the patient is obese, or if lipomata are present elsewhere in the body.

Carcinomata of the small intestine comprise about 2 to 3 per cent of all intestinal cancers, and occur most commonly in middle aged males. Ulceration occurs fairly early and stenosis relatively so. The prognosis is best when the growth is in the jejunum and bad when present in the ileum. These carcinomata may be either true adenocarcinomata or carcinoid tumours, sometimes called rodent ulcers of the intestine.

Symptoms: Tumors of the small intestine may cause very indefinite symptoms. Pain after food may be either moderate or colicky, and usually originates and remains in one place. Vomiting may occur. There may be alternating constipation and diarrhoea, and blood in the stools is found if there is ulceration of the growth. In some cases there is considerable loss of weight and rapid emaciation. X-ray examination may be of aid in the diagnosis but is not always reliable. Solitary tumors are rarely diagnosed pre-operatively. Obstruction with the benign tumors, especially the soft, pliable, and pedunculated ones, is more often responsible for intussusception than obstruction with malignant tumors, in the ratio of 2 to 1. Occult blood in the stools on repeated examination in the absence of ulcerative lesions of the stomach, colon, and rectum, should call for careful examination of the small bowel.

Treatment: The treatment depends on the presence or absence of complications. Intussusception caused by intra-intestinal neoplasms calls for immediate operation, and if conditions warrant it, resection of the portion of the bowel containing the growth. If a benign tumor is enucleable, enterotomy may be done and the bowel wall restored. In malignant growths of the small bowel, extensive resection of the involved area, together with any involved lymph nodes and the corresponding V-shaped section of mesentery should be removed. End to end anastomosis is preferable, because it results in perfect restoration of intestinal physiology, whereas following side to side anastomosis there may be some stasis; an enterostomy just proximal to the anastomosis is sometimes advisable.

Otosclerosis: its etiology and treatment

MACLEOD YEARSLEY.

(*Practitioner*, 1933, cxxxi, 606).

It was in 1904 that Denker of Erlangen published his classical monograph in which he described that special type of chronic progressive deafness which has long been a problem to otologists. Following von Troltsch, in 1859, he called it otosclerosis. This name is unfortunate as its loose application under the misapprehension that the disease was inflammatory in origin has led to confusion with the chronic deafness following post-suppurative and post-catarrhal changes in the middle-ear.

The classical otosclerosis begins in young adults, sometimes even earlier. Frequently it shows a definite hereditary tendency, and is much more common among women. Otosclerosis is characterized by peculiar changes in the labyrinthine capsule and the neighbourhood of the stapedio

vestibular articulation. These changes comprise a bony arkylosis of the stapes together with osteophytic outgrowths in the pelvis ovalis and lower parts of the scalæ tympani and vestibuli, with isolated areas of osteoporosis in the bony labyrinthine wall and in the regions of the cochlea and semicircular canals. These changes resemble those of rheumatoid arthritis and are of the nature of trophic changes due to alterations in nutrition.

The published papers upon otosclerosis during the decades following Denker's classic are legion, but no outstanding advances have been made as to the true cause of otosclerosis, and therefore, its treatment has remained more or less at a standstill. The majority of clinicians and pathologists have shown an unhappy tendency to concentrate entirely upon the ear itself without looking farther afield and no attempts have been made to seek pathological changes in the cerebral cortex of the temporo-sphenoidal lobe or in the auditory and adjacent nuclei in the bulb as suggested by clinical findings.

Chronic intestinal toxæmia is also a determining factor in the deafness of otosclerosis. An examination of ten otosclerotics showed signs of intestinal toxæmia, and this is in accord with the insidious nature of the disease, its heredity, its first appearance during pregnancy, and the facts of its pathological anatomy. The insidious and progressive nature of otosclerosis and its tendency to stationary intervals suggest not so much progressive changes in the ear itself as some basic general condition, such as a slow poisoning of the cortical cells and other brain centres of the auditory apparatus. Its frequent connection with pregnancy is due to the additional strain on the resistance and on the digestive and eliminating organs. The tendency of otosclerosis to be hereditary parallels the hereditary nature of chronic intestinal toxæmia. Women are more prone to intestinal toxæmia and to endocrine defects than men. It has been observed that 50 per cent of the sporadic deaf-mutes, with their mothers, gave definite evidence of intestinal toxæmia. The tinnitus, often one of the most distressing and intractable symptoms of otosclerosis, is usually of the continuous, high pitched hissing type, and frequently precedes the deafness, or is an early symptom. These facts point to a central irritation, and the tinnitus may be satisfactorily relieved or reduced by active treatment of the toxæmia.

Summing up the etiology, the blood changes due to the action of intestinal toxins produce similar results in the cortex of the temporo-sphenoidal lobe and in the grey matter of the bulb as those in the optic thalamus in migraine and in the degeneration of the occipital cortical cells in the various forms of amaurotic idiocy; such changes implicating the peri-capillary lymphatics in the temporo-sphenoidal lobes would result in the degeneration of the cortical cells of the hearing centres, and it is in an examination of these regions of the brain that the elucidation of the long-discussed problem of otosclerosis will be found.

Like many other diseases of problematic origin, treatment has been largely empirical, varied by occasional outbursts of periodic surgical ingenuity. The author's method has been a combination of intestinal treatment with oto-massage by the electrophonoide method of Zund—Burguet, to be carried out concurrently and persistently. The treatment of the intestinal toxæmia must be thorough and the means of attack should include diet, vaccines and efficient colon lavage. Any other source of septic toxins should be treated at the same time and any endocrine disorder should be suitably treated. Oto-massage has always been an established local treatment in otosclerosis. The instruments used hitherto were far too coarse in their vibrations and their prolonged use was bound to be harmful in the long run. The massage

afforded by the modern electrophonoid method is by sound, which has all the qualities of the human voice, and is the normal physiological, and therefore the ideal stimulus for the organ of hearing. It acts by promoting an active hyperaemia of the whole organ, thereby improving its nutrition. The results by this combined method of local and general treatment have been satisfactory. The best results have been in early cases who have realised the necessity for perseverance, and the earlier the patient is treated the better is the prognosis.

Corneal transplantation on an opaque cornea

J. W. TUDOR THOMAS.

(*Proceedings of the Royal Society of Medicine*, 1933. xxvi. 597).

The author describes the case of a man aged 22 who had opacity of both corneae following severe interstitial keratitis at the age of 18 and vision reduced to that of hand movements. Corneal transplantation was performed on the left eye, the graft being taken from the whole thickness of the cornea of a man of 42, of the same blood group after enucleation of the eye one month after a perforating injury. The operation was performed under cocaine anaesthesia, with a thin glass disc interposed between the graft and the overlying stitches. The graft was slightly smaller than the piece of opaque cornea removed, and the margins of each were cut shelving. The eye was covered with a shield and was treated daily with boric lotion and a mydriatic oil. The stitches and glass disc were removed on the tenth day, the graft having united well and nearly clear. During the next week it began to get hazy, and some minute blood vessels appeared in its stroma so that vision deteriorated, but a few weeks later it began to improve. Four months after operation the patient could count fingers at 2 feet; two years after operation he could count fingers up to 33 inches with the light behind him. The graft was uniform with the curvature of the cornea, and practically clear and transparent.

An operation for corneal transplantation has a profoundly stimulating effect on the rest of the cornea, leading to diminution of opacity at the periphery of the cornea. The slight opacity sometimes seen in the deep layers of the graft (with a slit-lamp) in the form of fine grey lines running more or less parallel, is due to new tissue formed behind the graft's Descemet's membrane. There is a new Descemet's membrane formed posterior to this new tissue, extending over the whole area of the graft.

According to Elschmig, it is inadvisable to perform corneal transplantation in a child under 14 years, in total leucoma, in cases where the iris is adherent to the cornea, in aphakic eyes, in cases with wide flat anterior synechiae, and in cases of glaucoma. Corneal transplantation is a small and specialised, but nevertheless important, branch of plastic work, and it gives a modicum of useful sight where none existed previously and enables the patient to enjoy a certain degree of independence. It shares with plastic surgery and ophthalmology the necessity that exists in each for precision and care, and demands minute attention to detail.

Aneurysms of the renal arteries

M. GERARD.

(*J. d'urolog. med. et chir.* 1932. xxxiv. 353, 449)

Forty-nine cases of aneurysm of the renal arteries are collected from the literature. There is only one kind of aneurysm of the renal arteries, the true aneurysm. The so-called false aneurysms are only complications of kidney injuries.

The triad of symptoms—pain, haematuria, and perirenal swelling—given in text books was based on examinations of false aneurysms. Of the cases reviewed, this triad was present in only five.

Aneurysms of the renal arteries, are about equally frequent in men and women, and may develop on either side. They are almost always unilateral and solitary. As a rule they are outside the renal parenchyma, within or immediately adjacent to the hilus, and generally are intimately connected with the pelvis.

Unruptured aneurysms generally occur in old persons and are caused chiefly by arteriosclerosis. They develop slowly and show a marked tendency towards calcification. The prognosis is good as they do not rupture. Ruptured aneurysms of the renal arteries are found chiefly in young persons and are produced by the usual causes of aneurysm in other locations. They develop gradually and the prognosis is very unfavourable. These aneurysms are twice as frequent as the unruptured aneurysms occurring in old persons.

Calcified aneurysms in old persons cause pain in the region of the affected kidney with ordinary urinary symptoms. X-ray examination will reveal an annular shadow, and pyelography will show it to be located at the hilus, but outside of the pelvis. An exact diagnosis of calcified aneurysms is therefore possible. Aneurysms of the renal arteries in young persons produce practically no symptoms until they rupture. After rupture the following three distinct clinical forms may be distinguished:

1. The pure haematuric form, found in about a third of the cases. Its development is quite slow, requiring several weeks or months. The prognosis is unfavourable. A diagnosis may be made by the usual urological methods, but the condition is so rare that it is often not considered. Arteriography will help in the diagnosis.

2. The form with perirenal swelling, found in about half the cases. It generally develops suddenly with a large accumulation of perirenal blood, pain, and signs of pressure and internal haemorrhage. The development of the swelling is so rapid and the patient's condition is so serious that it is rarely possible to do more than make a diagnosis of perirenal haematoma.

3. The mixed form with haematuria, perirenal tumour, and pain. This is rare, and is the only form that corresponds to the classical description and the only one in which the few diagnoses reported have been made. The prognosis is very unfavourable.

Following the rupture of a renal aneurysm operation is always indicated. In the pure haematuric form of ruptured aneurysm, time may be taken for urological examinations to determine kidney function. In the form with perirenal tumour and in the mixed form, operation is generally urgent, but, if possible, time should be taken for a determination of renal function. Operation is generally indicated in cases of unruptured aneurysm on account of the danger of rupture. It is contra-indicated when the patient is old and has generalized arteriosclerosis. In some cases, simple removal of the aneurysmal sac will be sufficient, but as a rule nephrectomy is necessary. The kidney pedicle should be clamped to prevent haemorrhage in case the sac of the aneurysm ruptures.

Painful Feet

S. L. HIGGS.

(*Lancet*. 1933. ii. 144.)

Of all the minor maladies a painful foot is one of the most disabling and depressing. The chiropodist, however skilled, can afford but temporary relief; he treats the corn but not the cause of it. If the bonesetter is consulted he usually discovers some "bones out of place" which he "puts back," by manipulation. Manipulation may be the right treatment if the pain is due to adhesions but, since accurate diagnosis and after-treatment are lacking, most patients are no better although they remain convinced that something beneficial has been done.

The normal foot has strength and flexibility. The muscles and not the ligaments form the natural support of the arches. If the muscles fail the weight falls on the ligaments which become stretched and painful. Adhesions and stiffness develop and the flexibility disappears. There is no merit in a high arch unless it is supple and under muscle control. In childhood pain in the foot is a serious symptom since a child under 10 years practically never suffers from foot strain and the pain may be due to tuberculosis of the tarsal bones or to some unusual condition such as Kohler's disease. An ex-ray examination is therefore essential.

Disorders of the longitudinal arch constitute a common cause of painful feet, and can be divided into three groups. The first, occurring in adolescence, is due to overstrain of apparently satisfactory arches, as in the case of a messenger boy who is far too much on his feet, resulting after a time in acute pain from spasm of the peroneal muscles and stiffness with the foot in the valgus position. Rest is an essential in treatment. Manipulation of the feet is carried out under an anaesthetic followed by a period of rest in plaster, during which time the boots are wedged on the inner sides and fitted with outside irons and ankle-straps. Removal of the plaster is followed by physical treatment and a gradual return to activity. A focus of infection must be sought as the condition may be complicated by arthritis of the tarsal joints.

In the second-group is the common foot stain which occurs among adults, either as an acute condition with marked oedema and painful spring ligaments, or as a chronic condition. Treatment for acute foot strain is by rest, support, gentle massage, and re-education in walking; a rigid metal frame is very harmful, and the best support is one made from a light plaster cast of the foot which serves to deflect weight to the outer side and fits snugly under the sole of the foot; wedges are fitted to the sole of the foot in addition. In the chronic condition the symptoms are an aching pain in the feet and cramp up the calves of the legs, loss of flexibility of the foot, movement is restricted, and attempts at flattening the arch hurt. Treatment is by manipulation under gas; the foot is put through the full range of planter flexion, dorsiflexion and inversion, whereby adhesions are broken down and the painful ligaments stretched. In many cases the pain disappears immediately mobility is restored. Instruction in exercises and correct methods of walking and standing are then given and the shoes are altered if necessary.

The third group includes the thorough-going broken-down flat-foot, in which the arch touches the ground throughout its length. Such a foot is not in itself painful but the onset of rheumatism or arthritis causes symptoms. Any attempt to restore the arches is useless, but the foot can be made more comfortable by suitable shoes.

Disorders of the transverse arch are more common in women than in men. The complaint may be of a bruised feeling, like walking on pebbles, under the balls of the feet, or of severe acute pain which occurs suddenly when walking and is due to nerve pressure. Short stockings which constrict the toes, and shoes of a bad shape with too high heels are the chief factors which cause this troublesome condition. Treatment is by a support, made from a plaster cast to take weight off the painful joints. If the toes are clawed and stiff, manipulation under gas followed by re-education of the intrinsic muscles and faradic foot baths will also be required. As a temporary measure strapping the fore part of the foot or a metatarsal bar gives relief.

Disorders of the toes: Hallux valgus is a common trouble among women; it is often associated with a flat transverse arch and is due to similar causes. The site of pain varies; it may be in an inflamed bursa overlying the prominent joint, in the big toe-joint itself, or in the other metatarso-phalangeal joints which are taking too much weight. In selected cases operative treatment gives excellent results. The modern method is to resect about two-thirds of the metatarsal head, preserving the bearing surface for the sesamoid bones. The bone is made absolutely smooth with a file and nothing is interposed between the joint surfaces. Careful after-treatment by massage and exercises is essential. An operation for removal of the bursae and exostoses only is unsatisfactory as the valgus deformity is not corrected and the trouble will recur.

Another painful condition is a stiff big toe-joint—hallux rigidus. It often occurs in adolescence and trauma is a factor in producing it. It may follow a sudden injury such as a stubbed toe, or be due to chronic strain through wearing short shoes and stockings. Usually an infective focus, such as septic tonsils, is also present. A traumatic arthritis is thereby set up. In the early stages rest and alteration to the shoe to support the inflamed joint are indicated. In the later stages, where typical osteoarthritic changes have occurred and the joint is very painful, good results may be expected from operative treatment. Removal of the metatarsal head may be disappointing through the development of arthritis in the new joint. A safer plan is to remove the exostoses from the head of the metatarsal and excise the proximal half of the first phalanx.

A hammer toe gives rise to pain because of shoe pressure on the painful joint. Pain may also develop under the ball of the foot due to downward pressure of the corresponding metatarsal head. The deformity occurs because the toe is overlong and is pressed into line with the others by the sock or stocking. Once it is developed the only treatment is operative. The toe should not be amputated. The usual operation of excision of the flexed interphalangeal joint may lead to a painful fibrous ankylosis. A better plan is to spike one bone into the other, by cutting the proximal phalanx into a point and fixing this into a hole bored in the base of the second. Firm internal splinting is secured and the patient can walk without pain in a few days.

Disorders of the heel: A painful heel is a common complaint, especially in middle age. There is often a history of lumbago or sciatica. It is due to plantar fibrositis and the tender spot is at the attachment of the planter fascia to the os calcis. A spur may be present, but since this is secondary and is not the cause of the symptoms it rarely requires removal. Dental sepsis is often responsible and should be treated. A soft sponge rubber heel pad should be fitted inside the shoe. Soda foot baths or diathermy will usually help to relieve pain.

1. Dermalgias analogous to the visceral dermatomes described by Head, which are characterized by a superficial localization such as the surface of the body over the scapular, thoracic, nuchal, or brachial region.

2. Visceralgias, which are characterized by their deep localization over the thoracic or upper abdominal viscera. These pains may be so pronounced as to lead to an erroneous diagnosis. Some authorities have gone so far as to say that all women presenting themselves with pain in the upper part of the abdomen should be subjected to a vaginal examination. Localization of the so-called referred pains may occur over organs named on the same or opposite side.

A classical example of the referred pain described is that of ruptured ectopic pregnancy, which may occur in any of the sites mentioned. For the latter, there are two routes of conduction: a cerebrospinal route from sub-diaphragmatic inundations and a sympathetic route from spills limited to the pelvis.

In subdiaphragmatic or peritoneal inundations the referred pain is due to irritation of the diaphragm by blood or gas (tubal insufflation) which has found its way to the subdiaphragmatic region. As the phrenic nerve, especially on the right side, gives off branches to the subdiaphragmatic peritoneum, any irritation of these fibres is conducted along its course to its common origin with the subclavicular and subacromial branches of the superficial cervical plexus and is transmitted to areas innervated by the latter.

Thoracic pain due to spills limited to the pelvis is a reflex pain from peritoneal irritation of the pouch of Douglas which is conducted through the hypogastric plexus and presacral nerves by way of the solar plexus to the cord and thence to the intercostal nerves.

A third route of conduction in cases of adnexal lesions without spill has been the cause of considerable controversy in the literature with regard to the pathogenesis of referred pain. Some believe that in cases in which the lesions are limited to the viscera alone, the stimulus occurs by way of the root nerves innervating the serosa, while others are of the opinion that as the sympathetics supply the visceral peritoneum as well as the parietal peritoneum, the stimulus is a sympathetic stimulus through the visceral peritoneum. Distension due to encapsulated or intracystic haemorrhage or inflammatory processes plays a dominant role in the causation of this pain. Cases of shoulder pain following ligation of the tubes (for sterilization) have been reported.

A specific treatment for trichomonad vaginitis

JAMES ROBERT GOODALL.

(*Lancet*. 1933. ii. 648).

Trichomoniasis or trichomonad vaginitis is a disease caused by a flagellated plasmodial organism probably originating in the bowel, and *Trichomonas vaginalis* is considered to be the specific organism of this well-recognized clinical type of vaginitis. The disease is characterised by a profuse liquid purulent vaginal leucorrhoea, causing an associated diffuse vulvitis. The symptoms arising from the latter are an intense pruritus, intertrigo, and acute pain on urination, due to the contact of the acid urine with the inflamed mucosa of the vulva.

On introducing the bivalve speculum the walls of the vagina are injected and tender, and the vault is filled with a yellow or greyish-yellow, thin, purulent liquid containing bubbles of air. The vaginal walls and portio vaginalis frequently present the strawberry appearance due to papillitis.

The disease is not transmissible (so far as is known) to the husband. It is most frequently mistaken for gonorrhoea. The condition may be acute or chronic. The acute cases are easily diagnosed clinically; microscopically the diagnosis is readily confirmed by a hanging drop of pus and normal saline, or better still, by pressing a coverslip down hard on a drop of pus. The organism is readily found by its motility and by the motion imparted to the pus cells in its immediate vicinity. It is impossible to demonstrate the organism during the douching treatment. Being a plasmodium it readily succumbs in vitro to all the antiseptics, but, per contra, the disease produced is very tenacious as a vaginitis. The organisms disappear quickly after douching, but reappear a few days after cessation or after the subsequent menstruation.

The treatment presented here was prompted by the ineffectiveness and long duration of the generally accepted treatments. It consists in using an acid antiseptic in a medium which will slowly dissolve, thereby keeping the vagina in a constant bath of disinfectant. These two factors are obtained by using vaginal cones of 1 per cent picric acid. As prepared by Wampole & Co., of Canada, the formula is as follows:

Picric acid, gr. 1.
Formolid concentrated, gr. 10.
Sodium tetraborate, gr. 5.
Zinc borate, gr. $\frac{1}{2}$.
Acetanilide, gr. 2.
Hydrastine, equal to tr. hydrastis, 15 minims.
Boroglyceride with gelatin, gr. 100.

A cone should be inserted high up in the vault on retiring. A simple acid douche (lactic acid 1 drachm to the quart) should be used once daily, in the morning. After the first treatment with the cone, the whole vulva becomes stained a pale yellow, owing to the picric acid. The cone should be inserted blunt end first, so that the vaginal contractions tend to drive it to the vault. If inserted point first, the same force tends to expel it from the vagina.

Ordinarily there is a strong tendency for the disease to recur immediately after the next or subsequent menstruation; a renewal of the cone treatment brings this recrudescence under control. There is no contra-indication to continuing the treatment during menstruation. The treatment may also be carried out during pregnancy, except perhaps during the last month of gestation. The distress from trichomonas infection during pregnancy is worse than at any other time. Should treatment begin just before menstruation the daily insertion of the cone may be continued throughout the period and for some days afterwards.

One of the patients had been previously hospitalised five times, one four times, and another twice for green soap lavage of the vagina and subsequent packing with gauze saturated with mercurochrome, iodine, and other hitherto approved forms of treatment with only temporary relief, followed by the discouraging reappearance of all the symptoms after the next menstruation. These cases subsequently responded quickly and, so far, permanently to a course of picric acid treatment.

The results have been uniformly successful. The average course of treatment is from 5 to 10 days, and owing to its simplicity, is not irksome. The pruritus usually disappears during the first three treatments, and the pus is generally absent after the third or fourth day. Desquamation goes on for sometime afterwards. By the tenth day the mucosa has taken on a healthy appearance.

Postmaturity and Malformations of the Foetus

PERCY MALPAS.

(Journal of Obstetrics and Gynaecology of Brit. Emp. 1933. xl. 1046).

The occurrence of post-maturity constitutes a problem which bears a very close relation to the more general problem, the cause of the onset of labour at its normal time. In post-maturity there is some disturbance of the factors normally determining the onset of labour at term. The only well-defined condition in which postmaturity is known to occur with any degree of frequency is anencephaly. Continuance of pregnancy beyond term is not a feature of foetal malformations in general, but is commonly met with only in association with malformations of the brain (anencephaly or hydrocephaly) and spinal cord (spina bifida).

The criteria of post-maturity cannot be laid down arbitrarily and each case must be considered separately. In general the criteria of post-maturity may be stated as follows:—

1. Continuance of pregnancy for at least two weeks beyond term.
2. Anatomical or radiological evidence of praeternatural intra-uterine development.
3. Absence of the changes characteristic of maceration.
4. Persistence of foetal heart-sounds and movements to within a few days of delivery.

In an analysis of a series of 238 cases of foetal malformations from the practice of the Liverpool Maternity Hospital for the years 1923 to 1932, there were 44 instances of anencephaly of which 9 were postmature (20 per cent). The cases of postmaturity in spina bifida numbered 3 (12 per cent), in hydrocephalus 3 (8.5 per cent) and in hydrocephalus with spina bifida 4 (20 per cent). In the whole series correlation could not be established between the age or the parity of the mothers and the incidence of postmaturity, other than the peculiar age incidence of these malformations generally. An abnormal menstrual rhythm was not exhibited in any of the cases, and the duration of pregnancy was found to be quite independent of the duration of the menstrual cycle. A departure from the normal length was not found in the postmature foetus.

It is most reasonable to regard postmaturity as an instance of disturbance of those factors which normally induce labour, and the onset of labour is determined by the foetus. Broadly speaking, labour is a change of environment induced by the foetus when all its tissues have reached a period of maximum viability. The anencephalic is in a suitable environment before delivery and it is rare for these monsters to undergo intra-uterine death and exhibit maceration; there is not any impulse toward change of environment because the foetuses are never truly viable, although born alive and surviving for a day or so.

The manner in which the foetus at term excites the neuro-muscular expulsive mechanism is still obscure. Certain points in the anatomy of anencephaly and hydrocephaly are perhaps significant. Absence of suprarenal bodies, or defect, has been noted in anencephaly; similarly the pituitary gland is either defective or absent in the postmature cases. Another factor in postmaturity is the marked preponderance of females, indicative of some definite foetal structural bias, probably endocrinal in nature.

The corollary of a review of the group of cases under consideration would be that the induction of labour by the normal foetus at term is effected by excitation of the expulsive mechanism of the mother by substances elaborated by the foetal tissues, and the foetal pituitary, suprarenal or actively growing nervous system are suggested as tissues which are concerned in this process.

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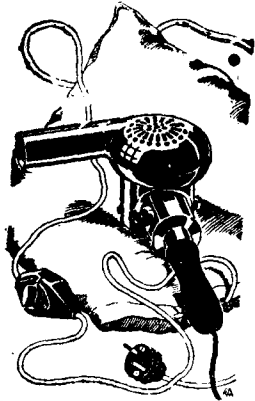
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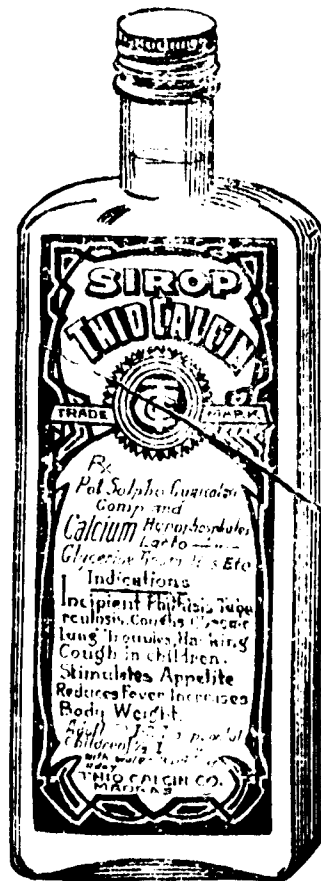
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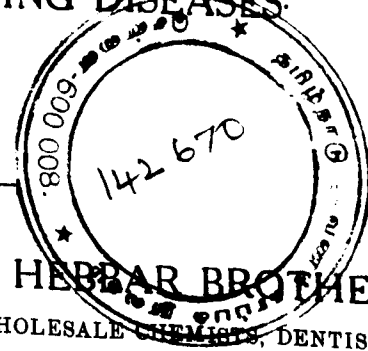
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