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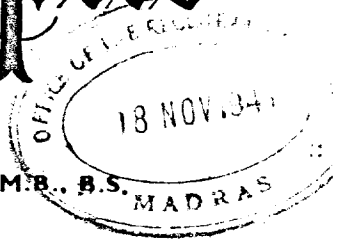
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The Antiseptic

A Monthly Medical Journal

Edited by

Dr. U. Rama Rau, M.L.C. & U. Krishna Rau, M.B., B.S.



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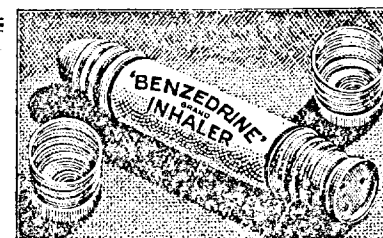
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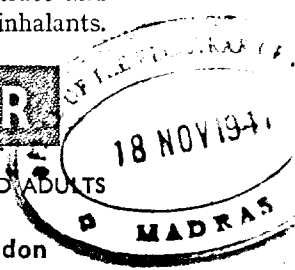
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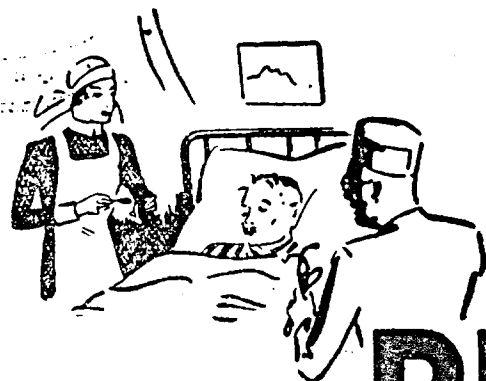
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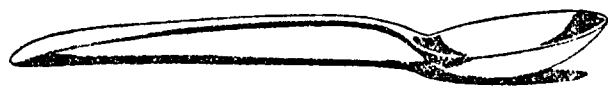
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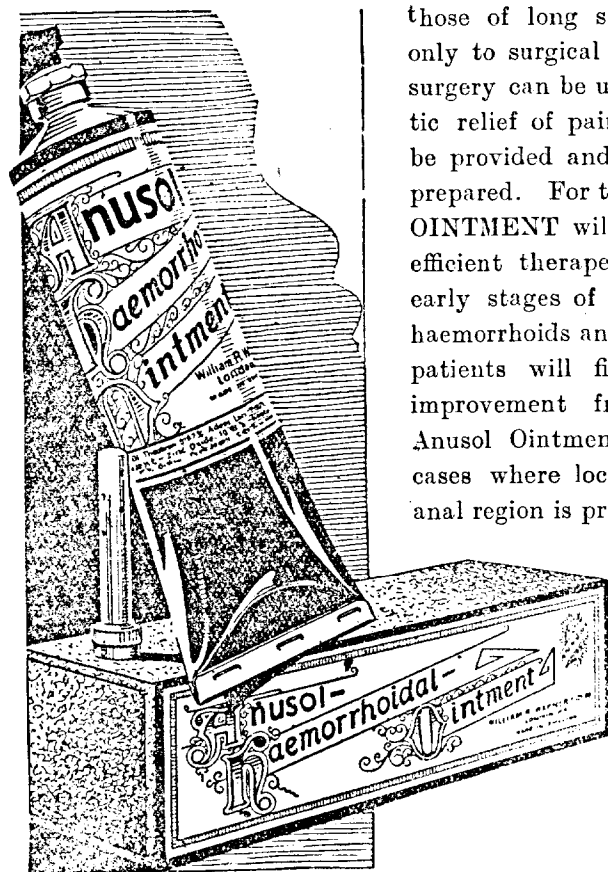
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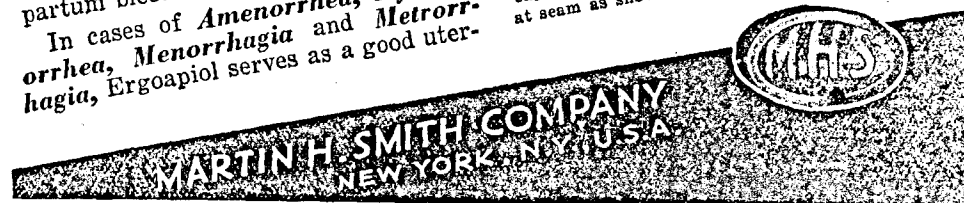
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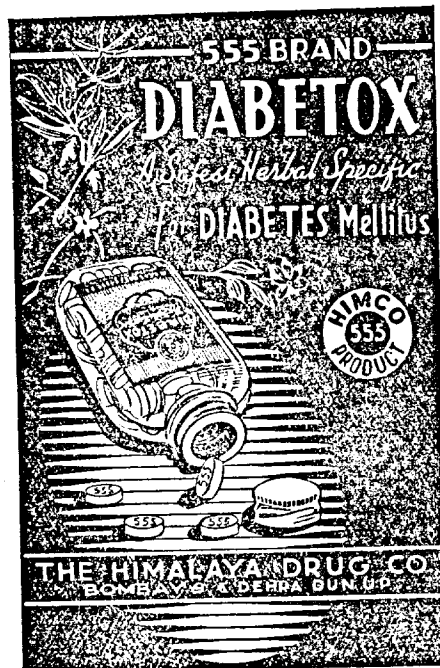
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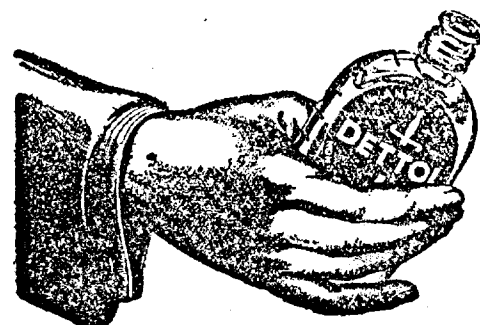
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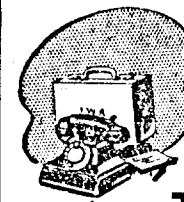
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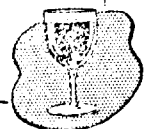
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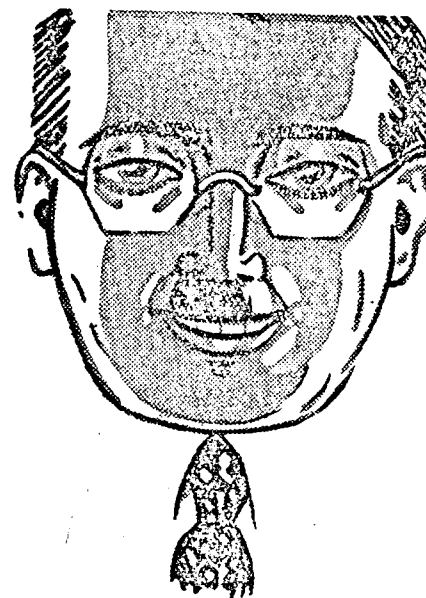
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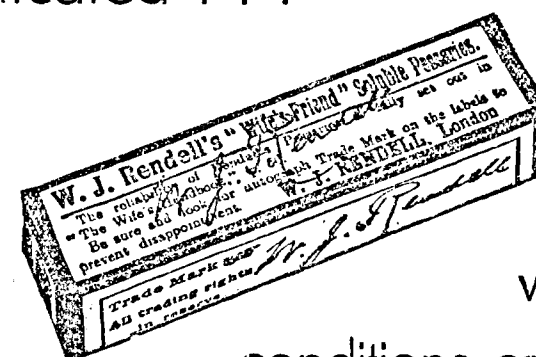
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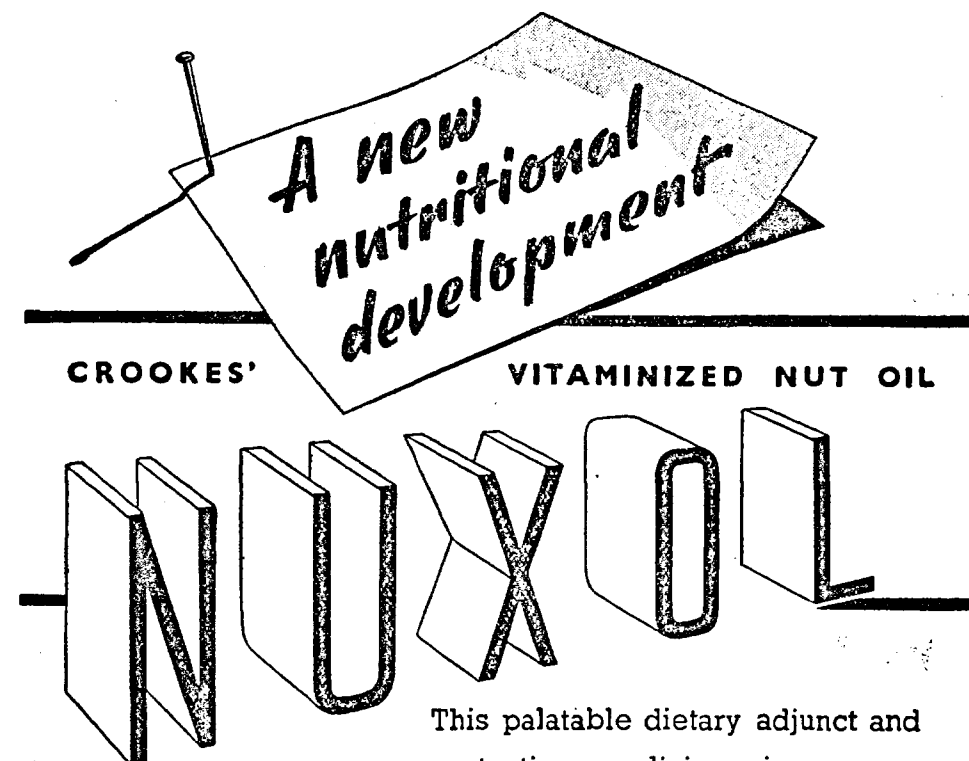
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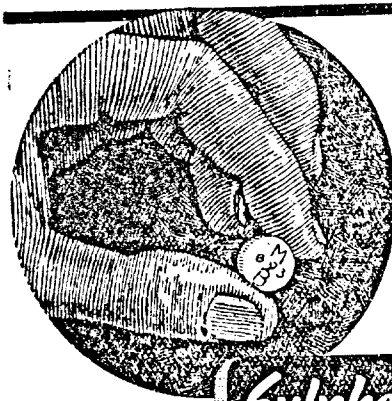
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Original Articles

Treatment of Pleurisy*

BY

JYOTI DHAR, B.SC., M.B.

Alipore, Calcutta.

Introduction.—BURRELL classifies pleurisy under two headings: tuberculous and non-tuberculous. But, from a therapeutic point of view, the inflammation of the pleura should be considered with respect to (a) whether the pleurisy is dry (*i.e.* sero-fibrinous); (b) whether serous effusion is present with it; or (c) whether purulent effusion (empyema) is present.

I. Dry Pleurisy.—As soon as a diagnosis of pleurisy (dry) has been made, the patient should be put to bed in a warm and well ventilated room. The bed rest should be maintained until after subsidence of any fever or acute pain. The diet must be nutritious and fluid or semi-fluid in nature. The bowels should be well regulated. A dose of Hydrarg Subchlor (Calomel) is best given at the onset of the illness.

1. In *acute fibrinous or plastic pleurisy*, it is essential to relieve the pain as speedily as possible. The immediate treatment for the relief of pleural pain consists of local application of warmth to the chest in the form of hot-water bottle or bag, electric pad, thermogen wool, Antiphlogistine, Kataplasma Kaolin, or a Linseed poultice (changed every four hours). Local application of tincture or ointment of Iodine, a mustard leaf, Capsicum ointment or small flying blisters may be applied. Care should be taken not to damage the skin with blisters, violent counter-irritants or excessively hot applications. Leeching is an old-fashioned practice and is very effective, but is seldom used now-a-days.

Strapping with strips of elastic adhesive plasters the affected side of the chest (from the vertebrae behind to the sternum in front, overlapping from above downwards) in full expiration helps relief of pain by mechanically limiting movement of the inflamed surfaces. Strapping of the chest is the most satisfactory procedure, but this may mask subsequent observation of physical signs. The broadest available strapping of three to four inches' width should be used, overlapping the midline freely both behind and in

* Specially contributed to 'The Antiseptic'.

front. Strapping is not recommended in patients who have hair on the chest, because its subsequent removal is very painful. Again, where the nature of the underlying chest condition is in doubt, strapping is not advisable, as it interferes with physical examination of the chest. Limitation of shoulder movement by an arm-sling is also useful.

Pain :—If the pain is severe, the usual poulticing and strapping alone is often ineffective. In these cases, a hypodermic injection of Morphine (gr. 1/4), or Omnopon (gr. 1/6 to 1/4) by mouth should be given at the start without hesitation, and repeated if required. Heroin is considered less efficient as an analgesic and has no special advantage over Morphine (JOHNSON, 1939). Pilula Saponis Co. (gr. 5) or Pulvis Ipecac. et Opii (gr. 15) are efficacious in average cases. Nepenthe (min. 10 to 20) may be given in a little hot brandy and water. The dry and useless cough may be checked by a sedative lozenge or linctus, such as the following (BURRELL):

R Morphine Acetate ... gr. 1/16
Acid Nitro-Hydrochlor dil m 2
Glycerine ... 3 1/2
Aqua ad ... 3 1

If this fails, a linctus containing Heroin should be substituted. Another useful linctus may be prepared as follows:

Syr. Codein Phosph. ... 3 4
Syr. Prunæ Verginæ ... 3 4
Syr. Cocillana Co. ... 3 4
Syr. Tolu ... 3 4

In less severe cases, Aspirin (gr. 10) may be given every four hours, and Dover's powder (gr. 10) is given at night to induce the much needed sleep. Sometimes, Aspirin and Dover's powder (of each gr. 10) are given for this purpose. BURRELL recommends a mixture containing Pyramidon and Bromide. For sleeplessness, Omnopon (gr. 1/3 by mouth), Soneryl (gr. 1½) or Medinal (gr. 7) will produce a good night's rest.

In cases suspected to be due to rheumatism, salicylates and alkalis should be given during the febrile stage.

Artificial Pneumothorax :—Severe pleural pain may be temporarily (for some hours only) and effectively relieved by induction of a small artificial pneumothorax of about 200 to 300 c.c., sufficient to produce a mechanical separation of the inflamed pleural layers. As mentioned above, the effect is temporary, and may be repeated if necessary.

Infiltration with Novocain :—For the relief of pleural pain of unremitting intensity, and where there are contra-indications to Morphine or its analogues, infiltration of the chest wall (immediately external to the parietal pleura) at the site of most severe pain with 10 to 50 c.c. of a 0.5 per cent solution of Novocain in sterile normal saline is recommended. JOHNSON (1939) recommends the following technic: The skin is first anesthetized with an intradermal bleb of 2 per cent Novocain, and a very fine sharp needle of sufficient length for the patient is then introduced very slowly through the chest wall at this site. The intermediate muscular and fibrous layers are insensitive structures, and no pain is experienced until the point of the needle approaches the parietal pleura. As soon as a sharp pricking sensation is felt, the 0.5 per cent Novocain solution is slowly injected until

the acute pleural pain is relieved. This will anesthetize the nerve-ending supplying the parietal pleura, and often separate the parietal pleura from the chest wall for a considerable distance. There is no risk in this method unless the needle has gone beyond the pleura (which will be evident by coughing).

When pain has subsided and the friction rub has disappeared, subsequent measures in the treatment consist of adequate rest (for a minimum period of two to three weeks after the evening temperature becomes normal and for another similar period if no pyrexia is found), charting of evening temperature, examination of the sputum for Tubercle bacilli, X-ray examination of the lungs for evidence of tuberculosis or any other underlying disease. If the primary X-ray examination proves to be negative, a re-examination should be repeated at intervals of six weeks to three months for the next two years (JOHNSON, 1939).

The convalescence should not be hurried and should include abundant rest, fresh air, and good nourishing diet (with adequate supply of milk, butter, eggs and cream). The patient should not be allowed to resume work until fully restored to health. If this is neglected and the patient is allowed to return to work too soon, an effusion which may develop will be overlooked until it has reached considerable proportions. If the case is tuberculous, prolonged treatment on sanatorium lines should be advised. In these cases breathing exercises should not be violent or too early started. Local rest is also necessary. For persistent aching and discomfort, application of diathermy to the chest wall is beneficial.

2. In *chronic dry pleurisy*, where coarse friction persists over a wide area for many weeks or months, the case is generally frankly tuberculous, as are also those cases of dry pleurisy which recur in frequent attacks at short intervals.

II. Pleurisy with Effusion.—The general measures in the treatment of pleurisy with serous (non-purulent) effusion include more prolonged rest. The patient should be kept in bed in an airy and well ventilated room until the temperature is normal. A preliminary purge is given. The diet should be nourishing, and liquid food should be given during the period of pyrexia. Fluids should be restricted and a salt-free diet is recommended. A simple diuretic, diaphoretic mixture is given and a Saline or Mercurial aperient is indicated. Many recommend administration of Potassium Iodide. Counter-irritants to the chest wall, in the form of Iodine or of fly blisters, are sometimes helpful. For the irritating cough, a sedative lozenge or linctus (as recommended for dry pleurisy) is recommended.

During the first two or three weeks, no active treatment is called for. But the limits of the effusion should be mapped out from time to time, the character of the temperature chart noted, and any breathlessness watched for. One should not be in a hurry to aspirate. It is best to give the fluid every opportunity to be absorbed naturally. WHITLA gives the following indications for aspiration :—(a) a very large effusion, which shows no sign of spontaneous absorption, (b) urgent pressure symptoms, e.g. increasing dyspnea, cyanosis, much displacement of apex beat, or a persistently fast pulse (120 to 130), (c) evidence of active tuberculosis in the underlying lung, and (d) when initial temperature shows no tendency to subside with rest alone and the effusion is a large one.

In many cases, pleurisy with sero-fibrinous effusion is of tuberculous nature. The degree of illness in these cases is greater; fever and malaise

are more marked; pain which is severe at the onset, is shortly replaced by dyspnea. An *exploratory (i.e. diagnostic) puncture* should be made in all cases with effusion, and the nature of infection determined. Paracentesis thoracis should be done carefully and must avoid traumatic aggravation of pleurisy. JOHNSON (1939) recommends that from 10 to 20 c.c. (some recommend up to 50 to 100 c.c.) should be withdrawn for bacteriological and cytological examination and inoculation into guinea-pig.

Technic of Puncture:—This is performed with a long needle (a short needle should not be used) of moderate bore attached to a 10 c.c. record syringe. Scrupulous asepsis should be maintained. The skin and pleura are anesthetized with a one per cent solution of Novocain. Sites of election for puncture are (a) below the angle of the scapula in the seventh or eighth space, or (b) in the mid-axilla in the fifth or sixth space. The puncture is made over an area which is dull on percussion. The patient should be either sitting with the arms folded and trunk arched forward, or lying on the sound side with the arm raised and carried across the front of the chest so that the hand grasps the opposite shoulder. The needle should be inserted close to the upper border of the lower rib, to avoid wounding the intercostal artery. Gentle suction is made when the pleural cavity is reached, and if fluid is found, from 5 to 10 c.c. should be withdrawn and placed in a sterile test tube for microscopic and bacteriological examination (WHITLA).

Respiratory embarrassment calls for aspiration. Cyanosis, distress or considerable mediastinal displacement call for partial withdrawal of fluid and its replacement by a small quantity of air. Another indication for aspiration is persistent hectic fever. Removal of fluid and its replacement with oxygen, nitrogen or air are advantageous. "This method permits of almost complete removal of the fluid, prevents cough and discomfort, lessens the tendency to recurrence of the effusion, and promotes expansion of the lung" (PRICE). But repeated aspiration and air-replacements may cause a rapid fresh outpouring of fluid and should be avoided. In aspiration, complete removal of fluid is not generally necessary, as the fluid left behind is gradually absorbed and promotes an obliterative pleurisy, with thickening of the pleura and subjacent fibrosis. But with positive sputum or where infiltration of the lung is limited to one side with a clear opposite lung field, the fluid is removed as completely as possible and the pneumothorax is maintained.

Technic of Aspiration:—Aspiration of fluids from the chest is most easily carried out with a two-way syringe. Air-replacement is done with a pneumothorax apparatus. A simple technic (without a pneumothorax apparatus) is recommended by JOHNSON (1939), who advocates an efficient, though less scientific method by the simple insertion of a second needle at a higher level in the chest. As fluid is removed from below, air is automatically sucked into the pleural cavity through the upper needle, the opening of which is covered by sterile gauze.

In performing aspiration, the patient should sit up in bed, or lie slightly turned on the unaffected side. The area of operation is painted with Iodine. The skin and muscles down to the pleura (to avoid pleural shock from which fatal result has been known to occur) should be anesthetized with Novocain or any Procaine or other local anaesthetic. The trocar and canula or the needle (as the case may be) should be carefully pushed into the pleural cavity just above the upper border of a rib (clear of the intercostal artery). The sites of election are (a) in the sixth space in the

mid-axilla, (b) in the seventh space in the posterior axillary line, or (c) in the eighth space just below the angle of the scapula.

If coughing occurs during the aspiration, the flow must be stopped until it passes off, the needle being left in position. But the aspiration should be altogether stopped if excessive and continuous coughing occurs, if pain is severe, or if albuminous expectoration with signs of edema supervenes. From one to three pints may be withdrawn, according to the size of the effusion. It is, however, better to withdraw too little than too much, because aspiration can be repeated, when required. Never withdraw the fluid too rapidly, as this will produce a high negative pressure in the pleural cavity and may cause sudden collapse and acute pulmonary edema. This can be avoided by introducing air to replace the fluid withdrawn.

If purulent change in the serous effusion occurs, the indications are removal of the purulent fluid, air-replacement, substitution by simple sterile olive oil, or gomenolised oil, the use of Acriflavine-Gelatine solutions, and gentle pleural lavage. Some cases require external drainage or a plastic operation.

Subsequent treatment is important. Sanatorium treatment, as for pulmonary tuberculosis *e.g.* rest, fresh air, and nourishing diet, is recommended. The patient should be kept under observation for a long a time. Periodic observation of weight, temperature, and X-ray examination for two years or longer are recommended.

III. Purulent Pleurisy (Empyema).—The treatment of empyema is purely surgical. As soon as a diagnosis has been made, the pus should be evacuated by operation. In streptococcal cases, the operation should be postponed until the fluid is definitely purulent. Premature operation is dangerous. A preliminary aspiration should be done in cases of large effusions and in streptococcal effusions, until the latter is ready for operation.

The operation is performed under a general or local anaesthesia, and consists in drainage 'by removal of a piece of rib sub-peritoneally and incision of the parietal pleura.' The wound is dressed at least twice daily, and the drainage tube must be sterilized, to prevent secondary infections. The pleural cavity may be irrigated daily by the Carrrel-Dakin method, or washed out with some antiseptic (Flavine, Brilliant Green, or weak Eusol). Pneumococcal empyema may be treated by repeated aspirations or by syphon drainage. If the pus is thick and difficult to evacuate, incision of the pleura with immediate suture is performed, any re-accumulation being treated by aspiration with or without oxygen replacement. If there are much toxic symptoms, drainage should be effectively established at once.

In chronic empyema or where the sinus fails to close, some form of plastic operation should be undertaken. The general condition of the patient must be carefully considered before any operation is undertaken. If drainage is satisfactory, autogenous vaccine sometimes proves useful.

Special forms of Empyema: In *apical* variety, the empyema is encysted, *i.e.* shut off from the rest of the pleural cavity. In these cases, the incision for drainage is made as near the lower limit of the effusion as possible. The *interlobar* variety is sometimes difficult to diagnose. It is treated as for pulmonary abscess. In *diaphragmatic* variety, the pus is usually encysted and diagnosis is often difficult. It is treated as for ordinary empyema.

Electrocardiography in General Practice*

BY

RAO SAHIB DR. A NARAYANA MENON, M.B., B.S.,
Madura.

THE object of my paper on this important subject is only to make a plea for more extensive use of this modern scientific laboratory aid in the investigation and study of the diseases of the heart. Now that reliable, accurate, portable, and easily operable apparatuses are available at a fairly moderate cost, it is highly necessary that the general practitioner should know "what information the E. C. G. can give and what its limitations are. In this paper, I shall only attempt to answer these questions and shall not deal with the interpretations of the electrocardiographic patterns of the various pathological conditions of the heart, as this subject requires a considerable amount of study and experience. Let me tell you at the out-set that electrocardiography, like radiography or fluoroscopy, is only an additional or confirmatory aid in cardiac diagnosis and cannot replace a carefully made out clinical history and a thorough physical examination of the case.

Electrocardiograph.—It was the great physiologist EINTHOVEN of Leydon who introduced the first clinical electrocardiograph in the year 1903. He conceived the idea of representing the electrical changes that take place due to heart action, as a graph. The original electrocardiograph of EINTHOVEN was a simple sensitive string galvanometer with arrangements to record the deflections of the string on a fast moving photographic film. The "string" is a microscopic thread of quartz coated with silver. It is suspended vertically in a strong magnetic field; when a minute current passes through the string, it is deflected or bent laterally. A strong beam of light throws the shadow of the string magnified by microscope on to a metal plate which has a horizontal slot which allows only a part of the shadow through to a moving photographic film on which the point of the shadow writes in a continuous curve. An improved model of this string galvanometer of EINTHOVEN is still used in some laboratories. The two other modern types of electrocardiographs available are the "Cathode-ray Oscillograph" and the "Mirror Galvanometer Electrocardiograph".

In cathode ray oscillograph, a cathode ray tube giving a thin pencil of the cathode rays was evolved in a circuit prepared, so that not only could tracing of the heart action be taken but also visualisation of the tracing is possible on the screen.

But the mirror galvanometer electrocardiograph first introduced by the G. E. & Co., in the year 1926, is the one extensively used in our presidency. In this rugged type of galvanometer, a small vane stands suspended in a clear cell of oil. A small mirror is attached to the vane and it is placed in a field of a permanent magnet. Three special vacuum amplifying tubes are utilised to amplify the current produced by the heart action. Thus, the physics of this type of instrument is more or less the same as that of the original string galvanometer of EINTHOVEN; but a mirror is substituted for the string and the movements of the mirror correspond to the deflections of the string. The model "B" Electrocardiograph of G. E. & Co. is their latest model. Because of a few distinct advantages *e.g.* oil-immersion, accuracy of tracing, portability, independent power unit (dry batteries), easy manipulations, etc. it satisfies every requirement of the physician.

* Specially contributed to 'The Antiseptic'.

A time-marker is also embedded in the instrument, so that there is a direct photographic registration of the time-intervals of 0.4 and 0.2 of a second in the abscissae of the graph. A milli volt of the current corresponds to a deflection of 1 cm. in the ordinates.

The basic principle of electrocardiography is very simple. By the middle of the 19th century, it was known that any form of cellular activity was accompanied by electrical disturbances between active and inactive cells. If any strip of muscle which is composed of cells, in any part is activated, negative electricity is produced and minute currents flow from the inactive to active cells.

It may not be out of place here to trace the changes that take place in the human heart during a cardiac cycle. Normally, the impulse originates in the sino-auricular node and spreads to the auricles and then through the *bundle of His*, to the ventricles. The impulse then reaches the outer heart muscle and the contraction of the heart takes place. The electrical stresses that accompany these phases of activity are necessarily small:

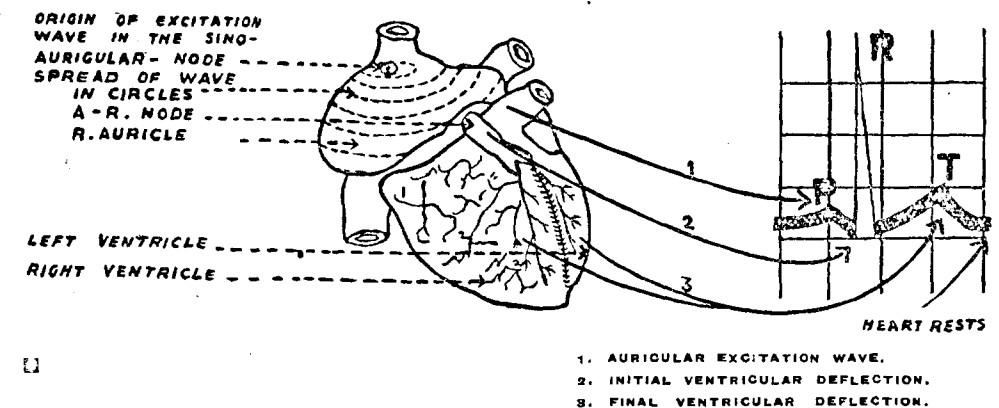


Diagram of the Conducting System of the Cardiac impulse and its Relation to the Electrocardiogram.

—Courtesy of : Practitioner's Library of Medicine and Surgery.

besides, as the muscle is separated from the skin by layers of tissues, much of the strength of the electrical impulse is lost. By the time it reaches the surface of the skin, the electrical potential that reaches the skin barely exceeds the order of 2 milli-volts. As I already said, it is to EINTHOVEN we owe the development of the electrocardiograph which records on a photographic film the electrical impulses originating in the heart. Thus, the electrocardiogram is only a record of the summation of the electrical stresses registering in succession the phases of the cardiac cycle. The magnitude of these changes is only a measure of the degree of imbalance of these stresses and is not a measure of the mechanical force of the heart beat. So, the point at which the heart is contracting most forcibly *i.e.* the peak of the ventricular systole, may coincide with a point in the iso-electrical line of the electrocardiogram where there is no deflection whatsoever. It may be emphasised that the electrocardiogram which is a tracing or record of the electrical phenomena accompanying the heart beat which cannot be appreciated by the unaided senses is thus entirely different from the

arterial or venous pulse tracing which is merely a graphic representation of something that can be seen and felt. In actual practice, it is obviously impossible to place the electrode directly in contact with the patient's heart but as the current produced within the heart spreads to all parts of the body, the electrodes are placed on certain arbitrarily chosen parts

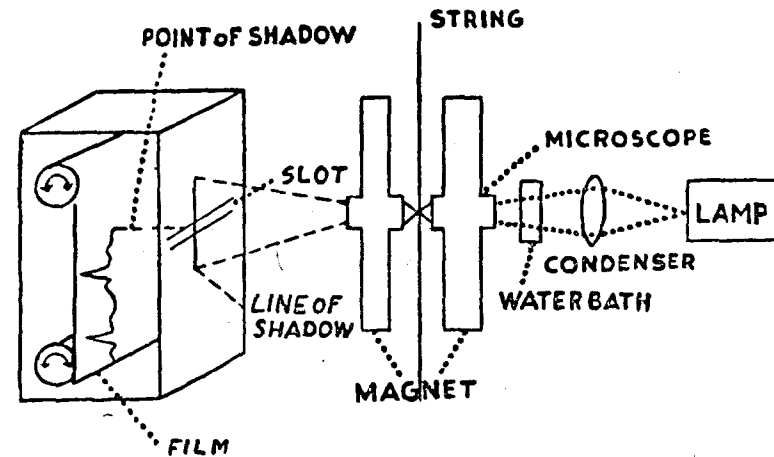


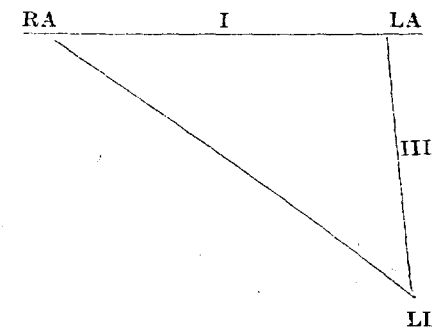
Diagram of the Electrocardiograph.

—Courtesy of: Practitioner's Library of
Medicine and Surgery.

of the body with the heart lying between them. EINTHOVEN's standardisation of patient's leads is followed even to this day. In order to obtain the maximum recording of the electrical changes taking place in different directions, three successive arrangements of electrodes or leads are taken—called *Leads No. I, II and III*.

A triangle is thus formed enclosing the heart within three directions. Because of the proximity of the above-mentioned successive leads to the heart, in *Lead No. I*, the voltages across the base of the heart will predominate; in *Lead No. II*, those between the base of the heart and the apex; and since the heart is tilted, and as this axis of the heart is parallel to the electrical

axis, it gives a composite picture and the various waves tend to be higher in this lead and in *Lead No. III*, the electrical events of the left ventricle predominate. The axes of the leads thus cut the heart in different directions and all lie in the frontal plane. It has since been recognised that as the heart is a three dimensional organ, the disturbances occurring within it would be recorded by placing electrodes in the antero-posterior



- Lead No. I: between the right arm and left arm.
Lead No. II: between the right arm and left leg.
Lead No. III: between the left arm and left leg.

axis. This led to the development of the præcordial or the 4th lead. The chest is placed over the apex of the heart and the indifferent electrode is placed on the left leg or the right arm, and the resulting leads are named Lead 4 F or Lead 4 R, depending on whether the left leg or the right arm is used for the indifferent electrode. The fourth lead is of particular value in the diagnosis of fresh cardiac infarction.

Normal Electrocardiogram.—In order to understand what the electrocardiograph is capable of doing and what one should not ask it, a knowledge of the normal electrocardiogram is very necessary. This record of a series of deflections of the galvanometer caused by the electrical disturbances associated with the cardiac contractions is named "P. Q. R. S. T." consisting of the several component parts representing the successive phases of the cardiac cycle. The electrocardiogram remains like the finger print,

remarkably constant for each healthy individual, and no two people on earth have identical electrocardiograms, except

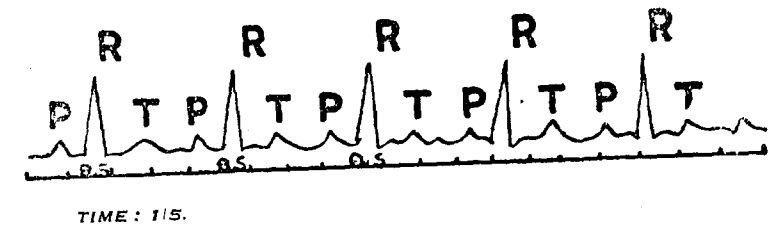


Diagram of the Normal Electrocardiogram.

those of homologous twins which show remarkably great similarity. Each wave or deflection from the iso-electric line signifies a change produced in the electrical potential produced by the spread of excitation or the contraction of the cardiac muscle. As mentioned already, the time record is also photographed with the cardiogram which helps us to know the single events and to determine the cardiac rates. The division in the abscissa, represents the time intervals—each small division to represent 0.04 of a sec., and each big division, .2 of a sec. The divisions in the ordinate represent the amplitude or millivolt—1 c. m. being equal to 1 millivolt of the current. To determine the cardiac rate the number of cardiac cycle between 30 thick vertical lines (6 section) is counted and this number multiplied by 10 gives the rate. The 'P' wave is produced by the spread of the wave from its origin in the sino-auricular node through the auricle and the contraction of the chambers. The wave is normally upright in leads I and II at least and of small amplitude and short duration and frequently invisible in *Lead IV* and even in *I* or *II* of the standard leads. Its absence in all leads indicates that auricles are not beating:—e. g. in the case of auricular fibrillation. The 'P R' interval or the time interval between the P wave and the Q R S Complex is the measure of the speed of conduction between the S A and A V nodes and is usually between 0.14 and 0.16 sec. with an upper limit of normal of .2 of a sec. A longer P R interval indicates a partial heart block, which may be due to abnormal vagal stimulations, toxic damage or disease of the conducting mechanism.

The ventricular activity commences with the QRS Complex. The wave of excitation spreads from the A-V node down the bundle of His and its right and left branches and through its arborization to the ventricular muscle. The QRS Complex mainly at least represents the invasion of the muscle by the excitation wave. The R wave is always upright. If the initial deflection is downward, this portion is called the Q wave, and if a downward

deflection follows the R wave, it constitutes the S wave. Normally, the upright R wave is always predominant in all the leads and the Q and S waves are small and frequently missing together. The total duration of the wave does not exceed 0.10 sec. When the QRS interval is longer than this, damage to the conducting mechanism known as the intra-ventricular block has occurred, and when the abnormal waves have a characteristic pattern, it can be inferred that the delay is mainly in either the left or the right bundle. The maximum amplitude of the QRS wave in the standard leads, which, in normal persons mean the R wave, is higher than either that of the P or the T wave and is 0.5 m.v., or greater. If the maximum amplitude is less than this in all the standard leads, it suggests that myocardial disease is present, although in the absence of other electrocardiographic abnormalities, it is unwise to diagnose heart disease from this sign. Among the causes of low voltage in persons with normal hearts are pulmonary emphysema, generalized odema, effusion into the abdomen, chest or pericardium, myxedema may also produce a low amplitude.

When the S wave is more prominent than the R wave in lead III the electrical axis of the heart which very roughly corresponds to the anatomical axis, has been shifted to the left or lies more nearly horizontally. If extracardiac causes for such a shiftment are excluded, the deviation usually represents the relative enlargement of the left ventricle. If on the contrary, the S wave is greater than the R wave in lead I, the right-axis deviation is present and is suggestive of relative right-sided cardiac enlargement. The active phase of the ventricular muscle contraction commences with the subsidence of the QRS deflection and is represented in the normal electrocardiogram by an iso-electric period followed by a wave which is upright (except in lead III occasionally), the T wave. In pathological state, the normally iso-electric ST interval may be elevated also or depressed below the base line. The significant degrees of such elevation or depression are usually associated with acute injury of the heart and are mainly seen in patients with acute myocardial infarction or pericarditis.

The T wave which has an amplitude of 0.1 to 0.5 millivolt may become flattened or elevated under certain conditions usually associated with toxic damage, or, ischemia or disease of the ventricular myocardium. Normally, the T wave in lead III is frequently flat or inverted. The total duration of the ventricular systole is roughly computed in the electrocardiogram from the QT interval. This interval may be prolonged as the result of heart disease but also may be lengthened as the result of toxic damage as in uremia or through the effects of Quinidine.

IV. Value of the Electrocardiogram.—Although Prof. EINTHOVEN was the father of the clinical electrocardiograph, it has been through the pioneer efforts of SIR THOMAS LEWIS and his writings that the knowledge of the clinical value of the electrocardiogram has spread throughout the world. THOMAS LEWIS stands at the origin of the electrocardiographic interpretation. In the words of LEWIS, (1937): "Electrocardiograph has taken us far; having filled gaps in our knowledge of these maladies (heart diseases), for it is a means of directly examining the all-essential heart muscle." He further says, "Cases of structural heart diseases are few in which an electrical examination is superfluous and in not an inconsiderable percentage of cases the records modify more or less profoundly our conception of the malady that we treat. In the preface of a recently published book on the subject, the authors, SCHERF and BOLD, state: "Present

knowledge of the alarming incidents of myocarditis, the early diagnosis of coronary disease, the possibility of recognizing atypical cases of coronary thrombosis, etc. would have been impossible without "electrocardiography."

They further state, "The E.C.G. alone may permit the physician to recognize the participation of the heart in diabetes, diphtheria, tonsillitis and in many other conditions. The E.C.G. alone may reveal the existence of coronary disease in patients who complain simply of abdominal fulness and flatulence in the absence of 'cardiac' symptoms."

According to Mr. L. E. ELLIS, M.D., the E.C.G. is of assistance in the diagnosis of cardiac disease by demonstrating the following conditions:

I. Disturbance of Rhythm. **II. Disturbance of Conduction:**—
(1) Between auricles and ventricles (auriculo-ventricular). (2) Within the ventricle. **III. Intraventricular and Bundle Branch Block.**—block of varying degree. **IV. Shift of the electrical axis of the E.C.G. as a result of:**—
(1) Relative enlargement of one or more chambers of the heart. (2) Displacement or rotation of the heart within the thoracic cavity. **V. Damage or disease of the myocardium, as a result of:**—(1) toxic damage or infection. (2) Coronary disease or myocardial ischemia. (a) acute myocardial infarction, (b) chronic coronary disease. (3) Acute pericarditis. (4) Pulmonary embolism.

I. Disturbance of Rhythm.—These can be diagnosed by the E.C.G. with a high degree of accuracy and E.C.G. has almost replaced the polygraph. In its early days, the clinical electrocardiograph was of value in distinguishing the different types of heart action such as auricular fibrillation, auricular flutter, extra systole, heart block and so forth. Although, these can now be recognized without its aid, the E.C.G. has not outlived its usefulness. The E.C.G. has an educational value to the physician who utilizes its aid as it helps to sharpen his clinical concepts by providing a ready means of checking and supplementing his observation. In the words of a great author: "Like the quality of mercy, E.C.G. is twice blest: it blesseth him that gives and him that takes."

II. Disturbance of Conduction.—Auriculo-ventricular block: Partial heart block can only be diagnosed by the E.C.G. or the polygram. The greatest importance of this finding is in the diagnosis of rheumatic arthritis. At least 30% of all patients with active rheumatic infection show a prolonged PR interval at some time during the course of the disease. Digitalis is another cause of prolonged A.V. conduction. It frequently does occur transiently in acute myocardial infarction of the post type due to thrombosis of the Rt. coronary artery. About 15 to 20% of the cases of post infarction show prolongation of the PR interval and in about 3%, higher grades of heart block are present. Such prolongation of the PR interval may be the only E.C.G. sign of cardiac infarction.

III. Intraventricular and Bundle Branch Block.—This condition can only be diagnosed with certainty by the E.C.G. The terminology and the exact electrocardiographic diagnostic criteria of the various types of heart block have undergone a good deal of modifications during recent years. Bundle branch block is now considered to be a non-specific sign usually the result of organic heart disease. Occasionally, it may be temporary as a result of some toxic effect upon the heart. It may be due to coronary thrombosis, or in rare cases, it may be functional. Its discovery is a relatively serious prognostic sign: however, if the patient survives a year after the discovery of the E.C.G. abnormality, the prognosis would seem to be considerably improved, as the block may likely be due to a focal lesion. Records which show a minor degree of prolongation of the QRS interval

(0.01—0.12 second) especially when associated with high voltage and if accompanied by other E.C.G. abnormalities, are very difficult of interpretation. Under such conditions, one should avoid a defective interpretation and should consider the record only in the light of the clinical findings.

IV. Shift of Electrical Axis.—Frequently, the enlargement of the ventricles is diagnosed by the shift of the electrical axis to the left or to the right. Apart from fluoroscopy and physical examination, the E.C.G. tracings are of definite help in cases of suspected enlargement of the heart. It is upon this diagnosis that much dependence can be placed in estimating the myocardial reserve in a particular case. The shift of the electrical axis may also occur to a certain extent by the extra cardiac conditions such as high diaphragm fluid or air in the pleural cavity or collapse or fibrosis of the lung. But with a marked cardiac enlargement, it is not uncommon to find ST interval slightly depressed in lead I: and raised in lead III with an inverted T_1 and an upright T_3 . This pattern is not found when the heart is simply displaced upwards or outwards by a high diaphragm. Under these circumstances, the ST inter-oals are iso-electric and the T waves are upright although T_3 may be inverted on occasions.

V. Myocardial Damage or Disease.—(1) *Resulting from Toxic Damage or Infection.* These changes may be associated with disturbances of the A-V or intraventricular conduction with shift in the electrical axis and are non-specific as far as the E.C.G. pattern is concerned. They are manifest by flattening or inversion of the waves, deviation of the ST interval above or below the iso-electric base line, prolongation of the QT interval, and diminution of the voltage of the QRS complex. These abnormalities may be present singly or in a variety of combinations. Digitalis, for example, typically produces a characteristic spoon-shaped inversion of the T wave, whereas Quinidine lengthens the QT interval. QT interval may be also prolonged as the result of toxic damage as uremia and other types of acidosis, in beri beri heart disease as well as in hypertensive and arteriosclerotic heart disease. The depression of the ST interval with flattening or inversion of the T waves in one or more leads is also seen in beri beri heart disease, as well as in severe anæmia. According to SCHERF, the same pattern is commonly found in women at the menopause. Severe myxedema typically produces a low voltage in all complexes, which is also found in myocardial diseases of various types.

(2) *Resulting from Coronary Disease and Myocardial Ischemia:*—The greatest clinical value of the electrocardiogram undoubtedly lies in the information it gives, and which enables us to diagnose acute myocardial infarction usually associated with coronary thrombosis. Even here a word of caution is necessary. The characteristic pattern of myocardial infarction may be confused with those produced on occasions by pulmonary embolism or by acute pericarditis. In these cases, several electrocardiograms may furnish the information which a single tracing may fail to reveal. In general, the majority of the electrocardiographic records taken on patients with a large acute myocardial infarction fall into the Q_1 T_1 or Q_1 T_3 types signifying a so-called "anterior" or "posterior" infarction.

In cases of myocardial infarction, it is hazardous to make a prognosis from the electrocardiographic evidence, as one never knows how much disease there may be elsewhere in the heart and the coronary artery or when another thrombosis will take place.

3. *Resulting from Acute Pericarditis:*—The most striking change may take place in the elevation of the ST interval in some or most character-

istically in all the 3 standard leads and often in the præcordial lead as well, especially if it is taken from the right arm to the apex. These electrocardiographic changes are especially apt to be present in purulent pericarditis or hemo pericardium; but they may occur in any type of acute pericarditis. They are often present only during the first few days of the pericarditis and may disappear in spite of the continuance or progress of the pericardial disease. Changes in T wave may also occur: there may follow the alteration in the ST segment or may be seen in the initial manifestations. They consist of inversions which occasionally occur in all the 3 leads as well as the chest lead,—a finding rarely seen in any other condition. These electrocardiographic changes were originally thought to be due to the presence of the accumulating pericardial fluid exerting a tamponade effect on the heart. They may be true in a few cases, but the more probable explanation in most cases is that they are due to a superficial sub-epicardial myocarditis which occurs as the result of the penetration of the præcordial inflammatory process in the superficial layers of the heart. Since pericarditis is often missed clinically, and since it is so important that purulent pericarditis be diagnosed early and correctly, the electrocardiogram offers a means by which the diagnosis can be made in a considerable percentage of cases. The electrocardiographic changes of acute pericarditis are most often confused with changes of acute myocardial infarction; but the changes in the ST interval and the ST waves involve all the 3 standard leads in pericarditis and the changes in the Q wave are also absent. Thus, mistakes in diagnosis can be avoided.

4. *Resulting from Pulmonary Embolism:*—Embolism: Recently, descriptions of characteristic electrocardiographic patterns resulting from pulmonary embolism have been published. This consists of the appearance of a prominent S_1 and Q_3 , depression of the ST_1 and ST_3 , with stair-case ascent and inversion of T_3 with upward convexity of the ST_3 . In a few cases, characteristic changes of recent myocardial infarction usually of the post type were also present. But the absence of a full-blown picture of the myocardial infarction, the failure of the T wave changes to evolve through a characteristic sequence of changes and the tendency for the abnormalities to disappear made the differentiation from cardiac infarction possible in the majority of cases.

VI. Limitations of the E. C. G.—The electrocardiogram cannot tell you whether the patient has V.D.H., as the valves do not convey neuro-organic impulses nor have they muscles. There is no direct registration of their actions in the cardiogram. It may give indirect evidence by the shift of the electrical axis suggesting relative enlargement of certain chambers of the heart. Similarly, the functional capacity of the heart cannot be accurately and directly measured from the electrocardiogram. We cannot judge from it whether a patient is suffering from congestive heart failure, or from angina pectoris. Like other laboratory aids, the electrocardiographic interpretations should always be made in the light of the clinical findings.

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Menon Clinic, Goodshed St.,
Madura.

Ocular Disturbances in Relation to Endocrine Glands*

BY

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MUCH has been known about the functions of the endocrine glands, but sometimes the general practitioner is confronted with signs and symptoms in the eye which have their bearing on the function of the endocrine glands and therefore it is necessary that the general practitioner should be conversant with some of these because he is the first man to get such patients, and I hope, the following lines will help him.

The autonomous nervous system is closely associated with the functions of these glands and the eye.

The autonomous system is subdivided into three sub-divisions:—the sympathetic, the parasympathetic and the visceral. The stimulation of the parasympathetic results in the increase of salivation, lacrimation, perspiration and other vasomotor changes, while that of the sympathetic results in the decrease of the above and increase in the pulse rate and dilatation of the pupils. Therefore, the actions of these two systems are quite antagonistic.

Pituitary Gland.—Anatomically and developmentally, this gland is divided into pars anterior, pars intermedia, pars posterior and fourthly, pars tubercis.

The anterior lobe is vascular and consists of two kinds of cells—clear and granular. Clear cells are chromophobe and chromophobic while granular cells are oxyphil and basophil. The secretion of the anterior lobe regulates growth and has great influence on other ductless glands. It stimulates the sympathetic nervous system and assists in the metabolism of protein, fats, water, calcium etc. If anterior lobe is removed, the adrenal cortex and gonads will atrophy. The action on the eye is through its effects on the sympathetic and parasympathetic.

Hyperfunction of the Anterior Lobe:—In mild disturbance of the function, there is transitory disturbance of the visual field and scintillating scotoma. Still increased, it produces acromegaly or gigantism depending on whether it occurs after or before the age of 25 years, and also opacities of the lens.

Hypoglycaemia and Glycosuria:—During pregnancy, physiological enlargement produces bitemporal contraction of the fields of vision when the gland is much increased in size:

Bitemporal Hemianopsia:—Irregular defects in the fields of vision. Pathological enlargement, contrary to the accepted view, does not always produce bitemporal hemianopsia, but one or both fields may be concentrically contracted. This may be due to pressure on one or the other optic nerve.

The Hypofunction of the Anterior Lobe:—Suggested cause of retinitis pigmentosa associated with condition known as LAURENCE BIEDL syndrome. It consists of Frohlic type of obesity, deformity of the skull, retarded mental development and retinitis pigmentosa. Hypothyroidism is usually present.

The Posterior Lobe or Pars Nervosa consists of mainly neuraglia and ependymal cells. The cells undergo hyaline and granular colloid change.

* Specially contributed to 'The Antiseptic'.

It stimulates the sympathetic nervous system and thereby the involuntary muscle. It influences the metabolism of Sodium Chloride, water and carbohydrates. Hyperfunction causes hyper-stimulation of the sympathetic, causes pigmentary changes and increases the smooth muscle tone. When the posterior lobe is enlarged, it causes pressure on one of the optic tracts and causes homonymous hemianopia, blurred vision, amaurosis and even swelling of the disc and secondary optic atrophy; headache is always associated with these enlargements.

The dysfunction of the posterior lobe is associated with angio-neurotic oedema. Lenticular opacities with diabetes insipidus; nightblindness may result from hypofunction. Those with hypofunction have heavy superciliary ridges, shaggy eyebrows and thick lashes, and often blepharitis and mild ptosis.

Leber's disease or hereditary optic atrophy has been ascribed to disturbance of the pituitary gland.

Thyroid Gland.—Any deviation from the normal most frequently affects the eye. The internal secretion assists in the stimulation of the sympathetic nervous system and mentality and acts as catalytic agent increasing the metabolic process and facilitates specially the chemical changes in the cells of the body. It influences the function of the pancreas, pituitary and gonads.

Hyperthyroidism.—Exophthalmos is mostly binocular. If this is not relieved, lagophthalmos results, and thereby, the eyeball and cornea are exposed, thus leading to keratitis with subsequent loss of the eye.

Graefe's Sign:—Failure of the lids to follow the downward movements of the globe.

Stellwag's Sign:—Blinking reflex diminished.

Mobius's Sign:—Convergence deficiency.

Darlymple's Sign:—Staring appearance. Staring appearance occurs also in other diseases such as hysteria in women; tetanus, stimulation of the cervical sympathetic; local inflammatory conditions; tower skull and high degree of myopia.

Kocher's Sign:—Immobility of the eyeball when the lid moves upwards and the eye is attempting to follow an object being moved in a vertical direction.

Joffroy's Sign:—Absence of usual wrinkling of the forehead when the patient looks up.

Rosenbach's Sign:—Trembling of the lids while attempting to close them tightly.

In severe cases acute mania occurs.

Hypothyroidism.—Oedema of the lids, sparse and brittle eye lashes and eye brows, marginal blepharitis, eczema, chronic conjunctivitis; occasional nystagmus, yellowish fold of oedematous conjunctiva in the lower cul-de-sac have been ascribed to this. Lacrimal secretion is diminished and frequency of blinking and squinting is increased.

Syphilitic interstitial keratitis occurs much more frequently in patients with hypothyroidism, myopia and lenticular opacities; multiple, non-infected chalazia.

LEMOINE has described oedema of the retina round the disc and macula extending 4—5 mm. into the retina. EUGLEBACH has described that the retinal oedema in myxoedema is associated with albuminuric retinitis.

Parathyroid.—The function is to control the calcium and phosphorus metabolism. Therefore, deficiency of the secretion produces calcium deficiency

and therefore increased muscular rigidity. It produces the following conditions in the eye:—ciliary spasm, blepharospasm, idiopathic spastic entropion, twinkling movements of the eyelids and eyeballs, hypersecretion of tear, zonular cataract, strabismus without error of refraction and occurring during convulsions in a child before the age of two.

Adrenal Glands.—Adrenal glands consist of two parts:—cortex and medulla. Cortical substance is indispensable to life. It assists in regulating the concentration of sodium and potassium in the body, controls pigment, stimulates the sympathetic and neutralises toxins.

It also assists in assimilation of vitamin C. Deficiency of the cortex produces:—loss of Sodium and retention of Potassium; loss of water and loss of weight. Increase in non-protein nitrogen and urea concentration in blood. Lowering of blood pressure. Increased sensitivity to Insulin. Irregular pigmentation. Muscular weakness. Increased capillary permeability with circulation collapse. In the eye, it produces enophthalmos.

Hypersecretion produces exophthalmos.

Medulla:—It affects pancreas and the secretion is antagonistic to Insulin hyperglycæmia. Stimulates the function of thyroid. Combined action of cortex and medulla regulates the body temperature and metabolism. It stimulates the sympathetic, constricts the smooth muscle. Myopia and glaucoma are ascribed to the deficiency of the medulla.

Pancreas:—Internal secretion regulates carbohydrate metabolism. External secretion digests fats and regulates alkaline reserve.

Hypofunction:—Increases blood sugar, and glycosuria changes in the lens: Refraction of the eye is altered i.e. increases myopia. Changes in the iris loss of pigment and iritis or rather uveitis.

Retinal Haemorrhages:—Sometimes, massive hæmorrhage in the vitreous retrobulbar neuritis, glaucoma, lipæmia retinitis. Increases the susceptibility to infection and therefore care during and after cataract operation in a diabetic.

Gonads.—The gonads are not self regulating organs that control their own function. The anterior lobe of the pituitary is the main regulator of the activity of the sex glands. The adrenal cortex is also gonadal stimulant and thyroid also indirectly. They stimulate the sympathetic nervous system deficiency results in hyperstimulation of the parasympathetic as manifested by vegetomia: blurred vision, marked discomfort in the eye, constant headaches, and inability to use the eyes without discomfort.

LEMOINE describes that hæmorrhage in the retina and vitreous in male patients have been improved after administration of ovarian extract. He considers it as mild hæmophilia for which the treatment is administration of the whole ovarian substance.

In short, the following diseases have been mostly ascribed to endocrine disturbances:—Glaucoma, cataract, myopia, keratoconus, interstitial keratitis, trachoma, uveitis, retinitis pigmentosa with status thymico-lymphaticus.

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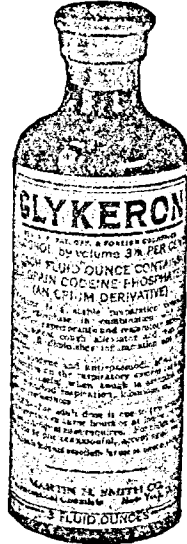
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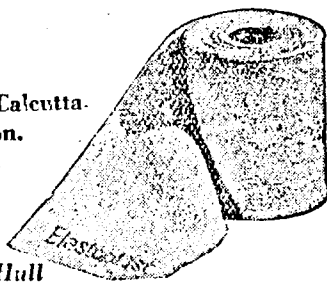
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S. MANSUR HUSAIN, B.Sc., M.B.B.S.

Lucknow.

IN this article, it is proposed to examine the intimate relation the ductless glands, the so-called 'Endocrine System' bear to the development and functions of the body. Human curiosity has led to the accumulation of a good deal of information about the glands but still man does not know all that is to be known about them. Unfortunately, man has not the pleasure and privilege of being fully acquainted with all the members of this complicated system. The claim of some of the glands (e.g. the pineal, and the carotid) to be links in the chain awaits elucidation and evidence. There may be other claimants to come forward in the future. Even the accredited members of this mysterious organisation are elusive, avoid familiarity, and their activities are shrouded in obscurity in spite of man's persistent efforts to become acquainted with all that goes on inside his body. All that he knows is the curious co-ordination and perfect co-operation exhibited by the glands. The best example of the subtle inter-dependence in the discharge of their duties is furnished by a relatively small body notoriously called the pituitary. It sends out messages in a chemical code to its colleagues and also to other parts of the body. They are correctly interpreted by those to whom they are addressed without confusion or mistake.

1. It has a control system of its own which is specifically concerned with the general growth and development of man's body.
2. Its chemical telephony with its friend residing in the neck is amazing.
3. Perched in a higher plane on the hard bed of bone protected by the soft brain, it looks down with meticulous care after the functions of the gonads, denizens of the lower strata.
4. It is in constant chemical communication with the adrenals living almost in the middle of the human length.
5. The pancreatotrophic hormone brings it in contact with the working of the pancreas.
6. It jealously guards against any encroachment on its sphere of influence by the Islets of Langerhans owing allegiance to the opposite camp.
7. The mammary glands, although outside the sacred fold of the endocrines, have to receive orders from the pituitary.
8. The parathyroid also has to bow to the parathyroidotropic hormone.
9. The general metabolism of the body is controlled by chemical messages constantly emanating from this busy station.
10. The ketogenic hormone speaks a language intelligible only to those whom it concerns.

Similarly, others also stimulate or depress their confederates for good or bad and the brunt has to be borne by the human body. Each member has definite and defined duties to perform. The organisation works as a wonderfully co-ordinated whole. No man-made machine is so complicated and perfect. Man, the highest and the noblest in creation, is its veriest slave.

* Specially contributed to 'The Antiseptic'

The Nervous System.—Man prides himself on his intellectual attainments, but alas, they are a gift from his endocrines. Man owes his peace of mind, mental equilibrium, nervous stability, memory, his psychological and physical reactions to various stimuli, and other mental attributes to the sanity of his ductless glands. His thyroid must not over-function to make him restless, irritable, excitable, and emotional. In the over-zealous activity of the thyroid a few become victims of depression alternating with exhilaration while others develop an irresistible desire to kill themselves or to kill others (Graves' disease). If this gland takes into its head (if it has one), for some reason best known to itself, to be deficient in the discharge of its duties at a later period of man's life (adult), the intellectual machinery slows down. He forgets most of the things and remembers little. Like memory, his powers of understanding forsake him and the mental hebetude is striking (myxœdema). If, on the other hand, laziness were to assail this gland in the beginning of man's life, it makes a cretin of him, with an undeveloped mind, taking no interest in his environments, and having no memory. The growing man is reduced to a level much lower than that attained by many an animal.

The parathyroid, so insignificant if compared with the huge body of man, wields a tremendous power over it. It has in its power to give him sleepless nights and tremors. The ovaries and testes are powerful enough to disturb the emotional balance. The adrenals can make a neurasthenic of him (Addison's disease).

Man is thus at the mercy of his glands for the development of his mind which distinguishes him from animals. The efficiency of his mental processes which determine his success or failure in life is intimately bound up with the activity of the small glands scattered throughout his body. His ability to overcome difficulties, his perseverance in the pursuit of an object, his powers of decision, initiation and concentration, his capability to adapt to varying environments and to react correctly to difficult situations are derived from the organisation his endocrines have set up inside his body.

Osseous System.—Whether man is to be a giant or a dwarf is determined by the pituitary (pituitary dwarfism and acromegaly). A thyroid, if in open rebellion, can create a pocket-edition of man (cretin). Testes by delaying the union of the epiphyses can add to his height (above the average). The integrity of man's bony structure is at the mercy of the parathyroids which, if actively pleased, can deposit more calcium than is good for his bones and can deposit it in other parts as well; and if passively displeased can decalcify his already good bones making them tender and liable to fracture. A woman sometimes curses her ovaries and at others her suprarenals for involving her in disability (osteomalacia). The retiring ovary sometimes leaves behind chronic villous arthritis as a parting gift.

Here, too, man looks up to his glands for proper height, proportionate limbs, good build, and healthy bones.

The Skin.—The health of his skin, another coveted possession of man, is necessary for his well being and happiness. The pituitary, the adrenals and the thyroid can change its hue. A lethargic thyroid in childhood (cretin) or even in adult life (myxœdema) can make man thick-skinned. The pituitary does not lag behind in this respect. Unlike thyroid, its over-activity can produce the same unpleasant result (acromegaly). The skin

will be moist if the thyroid so orders it and dry if the thyroxine does not lubricate the system (rough and harsh in myxœdema and hanging and loose in cretin). If the pituitary imposes on the human body the unwelcome Simmonds's disease, the skin becomes pale, dry and wrinkled.

Hair.—The endocrines are so well organised and efficient that the minutest detail does not escape their vigilance. Having shaped the texture and hue of the skin, they further decide on the quantity and quality of hair which is to cover it. If the testes do not extend their full co-operation, the hair may be scanty or absent. If the ovaries recede from the partnership, the hair may grow on unusual places *e.g.* face. When the thyroid is afflicted with inactivity, the hair becomes dry, brittle and generally falls out. If the pituitary wreaks its wrath on man, he is doomed to wear profuse and coarse hair (acromegaly). Besides the individual and corporate influence of the gang of miscreants, to the cortex of the adrenals is particularly assigned the duty of supervising the distribution and development of hair.

Man is to be attractive or repulsive and his appearance to be pleasing or disgusting as his glands ordain.

The Special Senses.—Man has to be grateful to his glands for the integrity of his special senses. A furious thyroid can produce exophthalmos, Stellwag's sign, Von Graefe's sign, Joffroy's sign, Mobius' sign, Jellinek's sign, Ballet's sign, in the eyes and the lack of protection results in the inflammation of the conjunctiva and cornea. If the thyroid becomes indolent and lazy, the hearing, and the senses of smell and taste are impaired. The parathyroid makes its presence felt by destroying vision through opacities. The pituitary strikes at the root (nerve) of sight (acromegaly). The unfortunate diabetic laments the loss of the function not only of his optic nerve but also of his retina. Imagine a man deprived of his special senses and he will deserve the combined pity of man and animal.

The Digestive System.—The energy-giving mechanism of man, his digestive system, can work properly when his whimsical glands permit it. A junior member of the erratic organisation, the so-called parathyroid, has the power to interfere with man's appetite and with the acidity of his stomach giving him abdominal cramps, nausea, and vomiting. Diarrhoea and constipation are the outcome of the wakefulness and sleepiness respectively of the gland residing in the neck. Pituitary, the arch culprit, can be responsible for 'anorexia nervosa.' What good or harm cannot the glands do to man by bestowing on him a good or bad digestion.

The Renal System.—An inactive parathyroid decreases the quantity of urine making man suffer from renal calculus and renal colic. In Frohlich's syndrome or diabetes insipidus, the results of the deviation of the pituitary from normality, the flow of the excretory fluid is excessive. The Islets of Langerhans in spite of their scattered situation in the pancreas can muster courage to non-cooperate and allow more sugar to accumulate in the blood than is good for the health of man. The excess of sugar has to be passed out by the body of the subservient man in the shape of copious urination.

The Blood Sugar.—There is a constant tussle between some of these potentates as regards the quantity of sugar that is to be allowed to enter or remain in the blood. The pituitary, the thyroid, and the adrenals are at constant war against the Islets and the warfare is of a chemical nature.

If the former three are in their usual balanced and health-giving mood, the fasting blood sugar is in the vicinity of 0.10 per cent rising to 0.14 or 0.16 per cent after the digestive machine has played havoc to the food. If the Islets get an upper hand, man faints with hypoglycaemia. If its three opponents emerge triumphant, there is more sugar in the blood than can be utilised by the body. If the Islets are vanquished, the unfortunate man is doomed to a diabetic life with its dangers, limitations, and miseries. Man perforce has to put up with the loss of useful energy when the sugar flows out of him in diabetes mellitus; acromegaly, and Graves's disease, the manifestations of the mischief of the Islets, the pituitary, and the thyroid respectively. Thus, healthy blood can flow into the veins of man if it satisfies the whim of his glands.

The Blood Pressure.—The glands have established their sway over the blood pressure of man, the extremes of which are dangerous to his health and life. They can bless man with optimum pressure so necessary for health and longevity. They can also curse man with Simmonds's disease, Addison's disease and acromegaly in which it is low. Raised pressures with concomitant symptoms and dangers are found in Cushing's syndrome and in the youthful activity of the adrenals. When there is a re-adjustment between the remaining partners at menopause or when the thyroid loses its proper sense of duty (myxoedema), or when the adrenals are themselves punished with a tumour the poor arteries have to sacrifice their elasticity.

Weight, Fat and Protruding Abdomen.—These very glands decree if man is to be a heavy weight or a light weight or if he is to be fat or thin impeding or facilitating his progress in the path of life. Weight increases in Simmonds's disease and decreases in Cushing's Syndrome. If the thyroid is over-wakeful or the parathyroid asleep, man's body withers and becomes emaciated. The thinning in Addison's disease makes a man cachectic. When the sexual glands are afflicted with senility or the pituitary produces Frohlich's syndrome, Cushing's syndrome or Adiposis dolorosa, man is forced to accommodate an extra bulk of fat in his body. Sometimes, through the mischief of the pituitary and the thyroid, he has to support a protuberant abdomen in the middle of his length. It seems as if his pituitary, adrenals, and sex glands have formed a sort of conspiracy to curse him with adiposity whenever it lies in the power of any one of them to do so. The pineal body, when attacked with disease, wreaks its vengeance on man by adding to his fat. Carrying as he does an extra load he can only waddle along in life and is generally left behind in the rapid march of time. He soon gets exhausted under the additional burden sinking into an earlier grave.

Metabolism.—The rate at which the human engine is to work is also determined by these very miscreants. The mechanism of the bodily machine is also controlled by them. The cortex of the adrenals, rightly or wrongly, is credited with the manufacture of a chemical substance which is extolled as having influence over the metabolism of chlorides, sodium, carbohydrates, and fats. If these substances so necessary for life, are to become part of the body, the help of this gland has to be invoked. The parathyroids are endowed with powers controlling the metabolism of calcium and phosphorus. As shown above, there is a constant tug of war for the sovereign rights of controlling the anabolism and katabolism of carbohydrates between the four members of the gang. Pituitary can lower the

basal metabolism in the garb of Simmonds's disease and acromegaly. Thyroid wields greater authority in this sphere of bodily activity. The speed of bodily activity can be retarded or accelerated, in either case destroying its efficiency and even jeopardising his health and life. It is the optimum rate of working which can render man happy and healthy and here again he is in the clutches of his glands.

The Face and Voice.—Man is made a cretin through the laziness of his thyroid gland. Even his face proclaims his slavery with low forehead, large tongue, and thick lips. If he ever makes bold enough to raise his voice in protest the pitch of his voice betrays him. It is hoarse in goitre, low pitched in the weaker sex and high-pitched in the opposite sex in adreno-genital syndrome or in the abnormality of his genitals.

The Circulatory System.—Man again has no control over the pumping station of his blood. In this respect too he is under the thumb of his glands. If the thyroid wills the rapidity of the pumping machine (100 to 200 per minute) at the cost of its efficiency, man is helpless, silently suffering the uneasiness of palpitation. The accelerated activity of the thyroid produces in the end dilatation and degeneration of the pump with consequent functional derangement.

The Genital System.—Man is not independent of his glands in the discharge of his sexual functions. Thymus in conjunction with other glands controls the development of his genital organs. Precocity in infants and children, effemination in man, virilism in women are associated with the increased activity of the adrenal cortex (Adreno-genital syndrome). Over-enthusiasm on the part of the thyroid causes loss of sexual power, amenorrhœa, or menorrhagia. Sluggishness of the same gland retards development, making the genital organs (*e.g.* penis) infantile. Lack of proper sense of duty on the part of the pituitary also stops the growth of these organs or causes sexual dystrophy *e.g.* in Frohlich's syndrome, Cushing's syndrome or Simmonds's disease. If the adrenals are afflicted with inactivity, dystrophy results. The intimate relation of the sexual activity with the glands is too obvious for man to deny.

Discussion.—The human race owes its existence to the proper functioning of his glands. Senility in man is the outcome of the senility of his gonads. Old age brings in its train not only limitations in the sphere of human activity but also cuts short the span of life. The glands have it in their power to defer senility or accelerate its advent. Pitiably is the one condemned to a life of premature old age. Is it not true that man is as old as his glands have made him? As a corollary, man is indebted to his glands for his vitality, youth, nay for his health and happiness. One can go a step further and say that his very existence is dependent on his glands. All this goes to show that, after all, we are what our glands have made us.

Let us turn to the other side of the picture, and conduct an enquiry into the private life of the glands. Several questions at once crop up. Are the glands absolutely independent of the influences which surround a human being? Is their activity not influenced by the impressions man receives through his nervous system at every moment of his life? Do the glands not respond to stimuli reaching them through the special senses or through the imagination? Are they not affected by the diet containing or lacking in some food factors *e.g.* vitamins? Are they not dependent for

their existence on a liberal and over-generous supply of blood with nutrients which the body provides for them? Are they exempt from the pathological changes which occur in all the other systems of the body in various diseases?

The glands will have to plead guilty to the weakness of reacting to the influences at work within and outside the body, be these influences psychological in nature or material in character. They can, at the same time, retort that they take an active part in the development of all the systems which compose the human body, and teach the organs to receive the stimuli and to respond to them in a well-defined and definite manner. They make a man's osseous structure, cover it with weak or strong muscles, and give him stable or unstable nervous system which controls and coordinates the functions of all the organs of the body. They provide nourishment to all the organs of the body through their influence or circulation and digestion. They control the metabolism and, above all, take a leading part in his psychological make-up. Man's body, as it is, is their handiwork. Health and disease, life and death, hang in the balance which they can maintain or disturb.

Admitting all the above claims, man can very well ask them as to who taught them to discharge their functions as they do. They will have to acknowledge heredity as their teacher. The whole question thus revolves in a circle and becomes too complicated and obscure to admit of an easy solution.

Conclusion.—Still, if an attempt is made to find an answer to the difficult and intricate question: is man what his glands have made him? the answer will be both 'yes' and 'no'. As has been shown above, the glands influence every aspect of man's life and thus the answer is 'yes'. Similarly, it has been discussed that they are not independent of the influences surrounding the human body, which really play an important part in making man what he is. The answer therefore is 'no'. The glands fade into insignificance in the face of the array of varied and varying influences, both physical and emotional, which act on the body from our childhood onward. On the other hand, the glands assume great importance on account of their ability to modify, magnify or minimise the effect of these influences. The correct answer to this question, therefore, is that the glands influenced by the multitudinous and multifarious factors acting on the body 'have made man what he is'.

Canning St., Lucknow.

Meningitis of Otitic Origin

BY

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THE following case is reported, as it presents many unusual features.

Master G., a healthy boy of 16 years, was seen by me on 10-2-39, his complaints being, pain in the left ear and the left side of neck below the ear, and severe headache.

Previous History.—He was suffering from chronic otitis media in both ears since 6-7 years. About four years back, he was operated on the right side for a mastoid abscess. Probably, a Schwartze operation was done. Both the ears were discharging mucus or muco-pus off and on, and he had become slightly deaf.

When seen by me on 10-2-39, he appeared dull and apathetic and complained of intense dull headache and pain in the left ear and along the left side of the neck for the previous two days.

On Examination.—Tonsils enlarged and throat congested, tongue coated white; Right ear:—membrane retracted, adherent with granulations protruding through old perforation but no discharge; scar of operation on mastoid area. Left ear:—membrane slightly congested, a pin point perforation in Membrana flaccida with a little watery discharge. Left side of the neck below the ear tender; no tenderness or swelling over the left mastoid. No vertigo or nystagmus. Hard of hearing in both ears for some years.

General appearance was like a case of beginning meningitis.

Treatment prescribed.—A mixture containing Tin. Ferri Perchlor. and Liq. Hydrarg. Perchlor.; Agarol; Prontosil Album tablets in full doses, with Caffiaspirin for the intense headache.

On the evening of 10-2-39, the patient had 103° temperature with rigors. So, the next day, his blood was examined. The laboratory findings were:

Blood:—No malarial parasite detected. Differential Count—Polymorphs 86, lymphocytes 12, monocytes 1, eosinophile 1.

The same treatment was continued on the 12th, 13th and 14th February '39. Now the headache and pain in the left ear was slightly less, but pain and stiffness on the left side of the neck had increased.

On 15-2-'39, in the evening, the patient had a severe rigor and his temperature went up to 105° and came down to normal during the night with profuse perspiration.

The headache became worse and pain in the neck had also increased. Blood and cerebrospinal fluid were, therefore, examined with the following findings:—

Blood:—No malarial parasite. Total W. B. C. 11300, Differential Count—P. 87, L. 12, M. 1, E. 0., C. S. Fluid—Film Pus cells present. No organisms seen. Glucose—normal, trace present.

The patient was now thought to be definitely a case of meningitis (probably streptococcal) of otitic origin and was being treated with full doses of Prontosil both by injection and by mouth and cleaning with Mercurochrome and Prontosil solution drops locally in the left ear, and Urotropin and Glucose intravenously.

At this time, he had intense headache and pain and stiffness of the neck on the left side. He was dull, deaf and was getting high fever daily. But there was no neck rigidity, no irritability or vomiting; nor was there swelling or tenderness over the mastoid.

On 18-2-39: There was no change, if at all he was worse. The result of C. S. F. culture was sterile after 36 hours. His blood and C. S. F. were again examined with the following findings:—

Blood:—Total W. B. C.—8750, Differential Count—P. 70, L. 25, M. 4. E. 1., malarial parasite—nil., C. S. F.—slightly opalescent, few pus cells and R. B. Cs., Smear—No organism seen. Albumin—100 mgm. per 100 c.c.

19-2-39: C. S. F. culture—negative. Blood culture—negative. Spleen was now palpable, otherwise there was no change in the clinical picture.

On 20-2-39, blood examination showed:—Total W. B. C. 13750, Differential Count: P. 88, L. 11, M. 1, malarial parasite—nil.

On 21-2-39, as there was no improvement in spite of the intensive treatment with Prontosil, an attempt was made to examine the discharge from the pinpoint perforation in the Membrana flaccida of the left ear. This ear was being irrigated with antiseptic lotion, and antiseptic drops were being used but the smear of the discharge on examination showed pus cells, K. L. B., Staphylococci and Streptococci, and the result of examining urine was sp. gr. 1010, acid, few urates, occasional leucocyte. As K.L.B. infection was detected, the patient was given 32000 units of Anti-diphtheria serum and also put on full doses of M. and B. 693 to control the Staphylococcal infection, and Prontosil was discontinued.

On 22-2-39: The culture of the ear discharge showed K. L. B. and Streptococci.

Blood examination showed:—Total W. B. C. 18125, Differential Count: P. 94, L. 4, M. 1., Nose swab:—No K. L. B., few Staphylococci. Throat swab—No K. L. B. seen. Urine—sp. gr. 1015, acid, albumin—nil, sugar—nil, bile—nil, pus cells and a few granular casts present.

Patient now felt pain in the hepatic area and the liver was enlarged two fingers below the costal margin and there was a slight icteric tinge in the conjunctiva. He was given further 12000 units of Anti-diphtheria serum. Probably, as a result of giving 693, his temperature came down to normal and it was thought that the infection was now under control. Pain and tenderness in the neck was also less. But the heart was showing signs of dilatation and the pulse was soft and rapid (120 per minute) and Coramine injections were added to the treatment he was already getting.

On 23-2-39: Nose smear culture showed—no K. L. B., only Staphylococci. Throat smear culture showed—no K. L. B., Staphylo and Streptococci grown. By now, he had intense jaundice, the liver was 5 fingers below the costal margin. The liver dullness had extended upwards also and the patient complained of intense pain in the right side of chest and difficulty in taking deep breath. The stiffness in the left side of neck and head-ache had practically disappeared.

Van den Bergh's test was done showing immediate direct positive.

The dose of 693 was reduced and other treatment—Urotropine Glucose intravenously and cardiac tonics were continued.

On 24-2-39: Patient felt comfortable that day. Headache and pain and stiffness in the neck had disappeared; but jaundice and liver enlargement had increased.

693 was then stopped. He was given Urotropin and Glucose intravenously with cardiac tonics. Leeches were applied to the liver area.

His temperature started again to be irregular. It suddenly shot up to 105° and in a few hours dropped down to normal. Heart sounds were soft and the first was replaced by a murmur. Pulse—120 per minute. He had developed a dry cough with signs of congestion at the lung bases.

Suddenly, at 3 p.m. after a fit of coughing, he started coughing up blood, which, in a few minutes, became quite profuse in quantity.

He was given Calcium, Congo Red and other hæmostatics, but without any relief. The bleeding continued and the patient collapsed and expired at about 5 p.m. He was quite conscious and talking till the end.

The patient was treated by me in consultation with my colleagues at the J. A. Hospital, Lashkar.

Discussion.—I am reporting this case, as there are quite a number of points of clinical interest.

Firstly as to Diagnosis:—When seen by me on the third day of his illness, there were no symptoms suggesting meningitis except headache. On the contrary, he appeared dull and listless with pain and a little discharge in the left ear and tenderness on left side of neck. That is why I advised that he should be kept under observation. But, he never developed classical symptoms of meningitis.

Secondly:—Stiffness and pain in the neck below the left ear. Prontosil had apparently no effect on this symptom, but the stiffness and pain disappeared after he was given the Anti-diphtheria serum. So, what was the stiffness due to? In typical cases of meningitis, there is stiffness and rigidity at the nape of the neck. In this case, the stiffness and tenderness were on the left side of the neck below the left ear. At one time, it was suggested that this might be due to sinus thrombosis extending downwards along the internal jugular vein, but this stiffness and tenderness disappeared later on.

Thirdly:—Although he had high temperature with rigors, no cause could be detected to explain this, as both cerebrospinal fluid cultures and blood cultures on repeated examinations were sterile; but, in localised meningitis, C. S. F. may be sterile and in sinus thrombosis blood may be sterile.

Fourthly:—The fact that smear and culture from the discharge from the pinpoint perforation in the Membrana flaccida of the left ear showed K.L.B., and Strepto. and Staphylococci. Streptococcus Hae. was present even 10 days after he was treated with Sulphonamide group of drugs. Infection of middle ear with diphtheria must be very rare. It is not mentioned in the literature.

Fifthly:—Pain and tenderness on the left side of the neck which was present since the beginning of the illness but disappeared after he was given Anti-diphtheria serum.

Sixthly:—Enlargement of the liver and jaundice. What was the

cause of this enlargement of the liver? Could it possibly be due to the Sulphonamide group of drugs given to the patient?

Methaemoglobinaemia has been reported in some cases treated with these drugs. Unfortunately, his blood was not tested for this.

And lastly, the fatal haemorrhage. It was too profuse to be from the lungs and if it was from the liver due to bursting of an acute liver abscess, what caused the abscess and what was the cause of its bursting through the diaphragm and the pleura?

As no post mortem examination was possible, reviewing the course of the illness, I suggest that probably the illness started as an acute exacerbation in a case of chronic catarrhal otitis media. As the perforation was in the Membrana flaccida, indicating that the focus of infection was in the attic, the infection spread upwards and caused patchy meningitis on left side of the middle fossa.

The sudden high temperature after the first few days is suggestive of atent sinus thrombosis, as sinus thrombosis supervening on mastoiditis may cause no other symptoms except the temperature. But there was no mastoid tenderness or swelling as is found in sinus thrombosis when the infection spreads from the mastoid cells to the sinus. In fact, in this patient, the mastoid cells were not at all involved as the active focus was in the attic area.

Treatment.—The unusual complication of diphtheria, infection of the middle ear, was treated with maximum doses of Anti-diphtheria serum. The point difficult to decide was, is K. L. B. infection of the middle ear as virulent as in the throat? If not, were the full doses of Anti-diphtheria toxin necessary?

Prontosil and Sulphapyridine-693 were given in full doses. Could they have caused hepatitis and jaundice?

Myocardium was affected. Was this due to K. L. B. infections?

Reviewing the course followed by this patient's illness, I now think that as sinus thrombosis might show no symptoms, he should have probably been treated, as a case of sinus thrombosis, and the mastoid operation done and the sinus exposed and slit open and the jugular ligatured. No doubt, this would have been a drastic step in the early stages of the illness; later on, with the myocardium affected, and enlargement of the liver and intense jaundice, any surgical interference could not be undertaken.

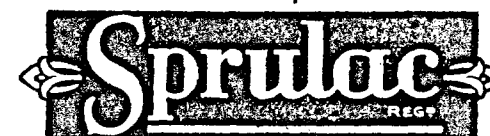
Recently, SUZANNE ROSSIAR, (These de Paris, 1940 No. 214, has recorded a fatal case of diphtheritic septicæmia—*Bri. Med. Journal*, 17, Aug. 1941.

Was this case also one of diphtheritic septicæmia?

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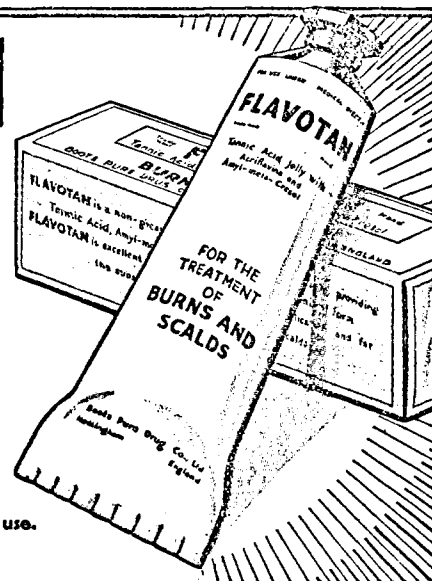
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Editorial

A Survey of War Surgery

THE principles of surgery are continually being enriched by new methods which stand the test of time. In war time, however, fresh problems arise which demand immediate attention and often require hasty improvisation. The surgical principles laid down as a result of the last war have stood the test of time and have remained the sheet-anchor of the present procedures. The present war has given new problems and new solutions have had to be devised. DR. L. R. BROSTER, D.M., M.Ch., F.R.C.S., Surgeon to Charing Cross Hospital, delivered by invitation to the American Surgical Association, a very instructive address on the Survey of War Surgery, which has been published in our distinguished contemporary, *The British Medical Journal*, and a summary of which we are giving below.

Early and free surgical excision still remains the basic and most satisfactory procedure in the treatment of war wounds. Although the open CARREL-DAKIN method is occasionally employed, the most important change has been the adoption of the closed-plaster method of WINNETT ORR and TRUETA and the use of drugs of the Sulphonamide group for combating infection. The consensus of surgical opinion is that the combination of excision, closed plaster and Sulphonamides has proved a great advance in the treatment of war wounds. Where this method has been used, as at Dunkirk, the wounded have arrived back in good condition and the wounds have been clean. This method gives the maximum of comfort and eliminates many of the difficulties of transport. Morale is high and there is practically none of that distressing condition of "shell-shock" which was so common among the wounded of the last war. This method is indeed a boon to the patient. It gives comfort and rest and eliminates the dread of the painful daily dressings of the open method. It has, however, certain objections. It requires constant supervision, for, on the appearance of a raised pulse or temperature, pain, sleeplessness, loss of appetite, œdema, or coldness of the toes, the plaster should be removed. If this is not done, the infection sometimes becomes anaerobic and gangrene has set in. Its greatest objection, however, is the nasty smell.

With regard to Sulphonamides, these can be employed in two ways—

prophylactically, or locally into the wounds; by mouth, starting with 2 grammes followed by 1 gramme four-hourly up to a total of 20 grammes, or by direct insufflation into the wound in doses varying from 5 to 20 grammes. Experience has shown that more satisfactory results are obtained with local application. The chief aim is to get the wounded to the nearest surgical unit. In these hospitals, the primary considerations are the arrest of haemorrhage and the treatment of shock. It is only then that excision should be carried out. This requires the removal, not too wide, of the skin, all devitalized muscle and fascia, and detached fragments of bone and foreign material. The more urgent call for early excision is in wounds of entry into fleshy parts with retained missile. In multiple wounds the larger ones only need be excised, as also those wounds complicated by fractures or involvement of joints.

With regard to suturing, although primary suturing of the large wounds after the application of Sulphonamides may be carried out within 12 hours, the general impression is against this procedure. On the other hand, some surgeons have reported success from primary suture in wounds two to three days old, but as infection has already taken place in these late cases, formal excision is not indicated. The wound, however, should be opened to provide free drainage, necrotic muscle and retained missiles removed, Sulphanilamide introduced, the wound covered with vaselined gauze, and the limb encased in plaster or splinted. When infection has been overcome, secondary suture can be undertaken.

With regard to bomb injuries, the experiences of the present war are different from those of the last. The number of the wounded has not come up to expectation; a higher proportion are mortal however. There is not so much of that extensive ploughing up of the tissues from high explosives and shrapnels as in the last war, for the modern bomb is more destructive than maiming. Wounding is more common from the secondary effects of blast, either from shattered glass or from falling masonry. Consequently, this war of aerial bombardment has been stigmatized as one of multiple injuries and marked traumatic shock.

The question of regional injuries was then discussed. With regard to head injuries, four principles of general application were cited: (1) Remove infective material and dead brain tissue. (2) Remove blood clot, extradural or subdural, and aerocele. (3) Consider whether a retained foreign body should be removed on account of traumatic epilepsy. (4) There is a definite impression that the Sulphonamides tend not only to localize infection but to delay the necessity for operation. The most important fact to be established is whether the dura has been penetrated or not, and every means should be employed to this end. When the dura is opened, damage to nervous pathways, spread of infection to the ventricles and basal cisterna, later abscess, and epilepsy must be remembered. The dural wound should not be enlarged unless the surgeon is prepared to remove necrotic brain and clot to prevent tension. Repair of the dura is unsafe. For the removal of necrotic brain tissue, forcible irrigation and suction should be used and all dirt, foreign bodies and detached bone must be removed. Tension should be controlled by repeated lumbar puncture. Retained missiles should be left alone, but if the clinical signs spread and the cerebrospinal protein content increases, bold measures for their removal should be undertaken.

With regard to abdominal wounds, their mortality is high and the

principles of treatment remain fundamentally the same as during the last war. All undoubted peritoneal wounds must be operated on, and the mortality depends largely upon how soon this is done. Essentials for success are accurate localization of the missile, local patching instead of resections and end-to-end anastomosis for preference, control of bleeding, cleaning out of the peritoneal cavity, and rarely drainage. Time and speed too are essential. Sulphanilamide dusted on the suture line, and 5% of this powder given with saline, into the peritoneal cavity, is a procedure that has been recommended by some surgeons. Wounds of the liver, spleen; kidneys and bladder should be treated on conservative lines.

Like wounds of the abdomen, chest wounds also are of low incidence and high mortality. A large number of these cases do not reach base hospitals. Open pneumothorax is the bugbear of these sucking wounds and must be stopped at once by vaselined gauze dressings and strapped. Repeated aspiration should be performed and if infected, rib resection with closed drainage. Foreign bodies, unless large and in the dangerous area of the hilum of the lung and pericardium, are better left alone. For shock and loss of blood, plasma and whole blood are given in large quantities up to 5 to 6 pints, the aim being to maintain the hæmoglobin at about 80%. Local application of Sulphanilamide into the wound is good, but the results of employing it in the pleural sac are as yet inconclusive.

Perhaps the most fascinating aspect of the treatment of modern war wounds is the advent of chemotherapy as an adjunct to surgery. There is a general consensus of opinion that where they have been employed, wounds are less heavily infected and in a healthier state than corresponding wounds in the last war. Much experimental work has been done with Sulphanilamide, Sulphapyridine and Sulphathiazole. Local application is considered superior to the oral route. The effects of these drugs have been most useful in the streptococcal infections. Anaerobic group are less susceptible. Antitoxic sera have also given protection against these infections. It is considered that these substances of varying solubility, act direct on bacteria and arrest their metabolism.

Among the many things that the war has brought into prominence may be mentioned, burns and risks. War burns present special difficulties of their own, in which the primary objects are to save life and limb and to preserve function. The Tannic acid treatment, which is very popular, has some disadvantages and that is in the commonest types of burns *e.g.* those involving the face and hands of airmen—it has led to severe scarring and even gangrene. Many ingenious and new methods have been tried out, among which may be mentioned: the triple-dye method, the Bunyan bag, the Edinburgh method and Saline baths.

Outside the areas of the extremities and flexures, Tannic acid is still considered by many to be the best form of treatment, when applied over a burn dusted with Sulphanilamide. Whatever be the method employed, the burnt area should be thoroughly cleaned with Saline and dried with hot air. For this purpose, Gas and Oxygen, Evipan and Pentothal are the most satisfactory forms of anaesthesia. Apart from the treatment of the actual burn, it is in dealing with its complications that work is so desirable. While primary shock has a mortality rate of 2 to 3%, secondary shock which comes on later, has a mortality rate as high as 60%. Unless there has been concomitant hæmorrhage, blood transfusion is not indicated

owing to the concentration of the blood which occurs, and blood plasma must be given to replace protein loss and prevent œdema.

Crush injuries have come forward into limelight. It is easily characterised by acute renal failure supervening in people who have been pinned down by fallen masonry and have been buried and subjected to pressure for a varying period. There may be no evidence of any local injury, but when there is injury, local swelling, œdema, whealing followed by bullous eruption and patchy areas of anæsthesia appear. A few hours later, in spite of vasoconstriction as shown by pallor, coldness, and sweating, the blood pressure falls and hæmo-concentration rises. Later, the urinary output diminishes and albumin and dark brown clots appear in the urine. The patient becomes alternately alert and drowsy, and his blood pressure often rises. Oedema, vomiting and thirst supervene, and blood urea and potassium become increasingly high, and death takes place about the seventh day. Post mortem examination shows necrosis of muscle, and cloudy swelling and degeneration of the renal tubules.

To those who took part in the last war, shell shock was common and it has now been replaced by traumatic shock of varying and severe degree, for apart from wounds, it is a handmaiden to burns, blast and crush injuries. The mental state of the patients, all of whom had received Morphine, was quiet and still; very few of them were excited. They were usually pale, dry-skinned and thirsty. Some had nausea and vomiting. Their pulse rate was about 100; its quality varied, being thin, impalpable, or collapsing. Blood pressure was below 100. A rise of 10 points in blood pressure and improved temperature and colour and mental state were taken as indications to warrant surgical intervention. As a rule, the need for transfusion was in proportion to the severity of the injuries. Plasma was given and whole blood, if hæmorrhage had occurred. In severe shock, transfusion may be difficult owing to the collapsed condition of the veins, and local warming of the arm has proved helpful in getting the blood in satisfactorily. The organisation of the blood transfusion service has been one of the main successes of the present-day hospital system, and the prompt access to reserves of stored blood has been most helpful and has resulted in the saving of many lives.

Gleanings From Medical Press

Medicine and Therapeutics

A Note on the Treatment of Lepromatous Ulcers.—E. MUIR—Ulcers in leprosy are of two kinds: lepromatous and trophic. My experience in India showed that trophic ulcers were by far the more common of these two. An investigation of all ulcers in the large leprosarium at Purulia showed only between one and two per cent to be bacteriologically positive, the rest being of a trophic nature resulting from affection of the nerve supply. On coming to the Trinidad leprosarium at Chacachacare, I was astonished to find that the great majority of ulcers are of a lepromatous nature, that is, due to the breaking down of nodules and diffuse

leproma. These are full of masses of bacilli which are constantly shed off from the surface. The treatment of these ulcers was a problem. The sisters who dress the wounds spent a large part of their time in dressing these constantly discharging wounds. The patients, loaded with dressings and bandages become immobilised and bedridden and their limbs, and especially their fingers, become stiff and atrophied.

Reading an article by Ross and Hulbert on the treatment of air battle burns with silver nitrate, tannic acid and gentian violet, I tried this method with these ulcers. The results obtained were highly satisfactory

After a few applications the discharge was controlled, and in many cases it was found possible to do without dressings or to apply only a loose cloth covering. Septic absorption ceased. The patients felt much more comfortable. They were able to move their limbs and especially their fingers and thus avoid one of the chief causes of atrophy and deformity. A considerable amount of the valuable time of the staff was saved and the danger of spreading infection was considerably lessened.

The treatment, as slightly modified, consists in painting first with a one per cent solution of gentian or methyl violet in alcohol, then with a ten per cent solution of silver nitrate in distilled water, and, lastly, with a fifteen per cent solution of tannic acid in water. On the first day this is repeated three or four times, but in most cases after the first day one painting, either with tannic acid alone or with the dye solution followed by tannic acid, is sufficient. The patients particularly appreciate the treatment of the lips and the face in this way, parts to which it is difficult to apply cloth dressings. Many ulcers which had remained discharging for weeks at once began to heal up, and the improvement in the general health and the comfort and cheerfulness of the patients was remarkable. I can strongly recommend this very simple and effective form of treatment.—*The Leprosy Review*.

Advance in Treatment of Peripheral Vascular Disease.—Raynaud's disease. This may be due to chronic arsenic intoxication, and favourable results have followed the use of sodium thiosulphate, administered intravenously (0.5 Gm. twice weekly for 1.20 weeks.)

Arterial embolism. Diffuse regional arterial spasm must be broken. Papaverine hydrochloride intravenously or intraarterially is helpful as an antispasmodic. Dose $\frac{1}{2}$ gr. every hour or so.

Thrombo-angitis obliterans. Stop smoking. Typhoid vaccine intravenously very effective in producing vasodilatation in the extremities. Eliminate foods rich in phospholipins. Sodium iodide thiosulphate in 3.3 Gm. doses intravenously every other day for 3.6 weeks.

Arteriosclerosis. Reduce any elevated level of blood fat by eliminating eggs, milk products, and fat meat.

Mechanical devices for peripheral vascular diseases are valuable, and include the following: the Sanders bed, intermittent arterial compression, intermittent suction and pressure.—*Edgar V. Allen, in "Journal of the American Med. Assoc."*

Vitamin E in Muscular Dystrophy.—Stone in the *Journal of Pediatrics* (18, 310 (1941, Mar.) recommends the use of vitamin E in cases of pseudohypertrophic muscular dystrophy and myotonia congenita in children. Two cases of each condition were treated efficaciously with 2 to 4 cc. of fresh

wheat germ oil daily. To improve appetite and weight thiamine was also administered. Vitamin E was also shown to cause improvement in muscular strength in a series of children with poor muscular development generalized (muscular hypotonia). An initial dose of 8 to 12 minims of the wheat germ oil with B complex was given the latter cases. From these conditions it was concluded that vitamin E is important for normal muscular growth in infants and children. The newborn infant may suffer from impaired musculature growth if the mother was deficient in the vitamin E during pregnancy or was unable to transmit the vitamin to the child. The vitamin E and B complex mixture is generally well tolerated by children and infants. A reddish rash may occur in occasional cases but disappears upon temporary discontinuance of the therapy and is probably due to some ingredient in the oil. Infants' diets may often be deficient in vitamin E.—*Medical Times*.

Recent Advances in Treatment of Gonorrhea, by D. J. Mackinnon, *British Medical Journal*.

Different methods of treatment for gonorrhea were applied for comparison. They are the following:

1. Irrigation.—A group of 3454 men were treated with irrigation with 1 in 8000 potassium permanganate and no sulphonamides daily. Of these 583 developed right, left or bilateral epididymo-orchitis, and 0.85 developed prostatitis epididymo-orchitis (a total rate of complication of 6.68 per cent). The average time taken to attain cure was 7.44 weeks.

2. Uleron.—The drug plus irrigation as in treatment 1 was tried in 50 cases. It gave good results and shortened the time taken to attain cure to 5.28 weeks, compared with 7.44 weeks with irrigation alone. Two cases out of 50 in this group developed right epididymo-orchitis and no other complications.

3. Sulfapyridine with Irrigation.—The sulfapyridine combined with irrigation proved to be a successful treatment. It reduced the time required for cure to 3.71 weeks. Experience showed that the minimal period of irrigation plus sulfapyridine likely to give 100 per cent cure was approximately as follows: First week: Irrigation with 1/8000 potassium permanganate daily, plus 0.5 gram of sulfapyridine 3 times a day. Second week: Irrigation plus 0.25 gram of sulfapyridine 3 times a day. Third week: Irrigation alone. Treatment was then discontinued, and provocative and other tests were carried out. Only 0.8 per cent of cases of epididymo-orchitis were registered in the group of cases.

In the very resistant cases, particularly when epididymo-orchitis had developed, 20 cc. of 0.25 per cent euflavine given intravenously once a week was found more effective than the sulphonamides.

In adult female gonorrhea the sulphonamide treatment considerably reduced the

time required to attain cure but the reduction was not nearly so marked as in male gonorrhea.

This is probably due to (1) the greater difficulty in penetrating or aspirating the cervical glands as compared with the efficient aspiration of the urethral glands in the male irrigation; and (2) the fact that gonococcal invasion of the female cervix is deeper (a considerable number of the gonococci being situated intra-epithelially).

It was found from the experiments that sulfapyridine is more effective in acute cases and uleron is better indicated in chronic gonorrhea.

In vulvovaginitis in girls the treatment used was superficial swabbing of the interlabial area, gentle irrigation of the vagina with 1-volume hydrogen peroxide, and dry swabbing and dusting of the vulva with calamine powder.

The author concludes that sulphonamides are very successful when and where the gonococcus is accessible (extracellular) but they are not so successful when it is intracellular (as for example, in chronic female gonorrhea).—M.Q.—J.P.M.A.

Prostigmin in Neuralgias.—T. C. Davies (*Eye, Ear, Nose and Throat Monthly*, September, 1940) found that prostigmin has marked cholinergic and anti-spasmodic actions of value in a number of varied conditions. The cholinergic action is important in its effect on the nerves to preserve or increase production of acetylcholine. It acts as a tonic to the nerves, in turn improving muscle tone. The anti-spasmodic action is of value in neuralgias. In addition prostigmin possesses excellent vasodilator properties. Its lack of untoward effects on the eyes, or on the circulatory or respiratory systems; and lack of toxicity to the spinal cord and the brain give it an advantage over its homologue, physostigmine. Eleven cases of trigeminal neuralgia were studied, with nearly total improvement. Wm. Steel reports in the same article 20 cases of nerve pathology with encouraging results. Davies recommends tri-weekly intra-muscular injection of 1 : 2,000 solution prostigmin methylsulphate for a total of 50 injections. Two prostigmin bromide tablets are administered orally in a few cases on intervening days. Potassium chloride, 45 grs. daily, accelerates prostigmin action in severe cases.—*The General Practitioner*, June 15, 1941.

Primary Carcinoma of the Lung—By James Burnet, M.A., M.D., F.R.C.P.E., LL.B. (Lond.).

It is stated by some writers that primary cancer of the lung is becoming much more common than hitherto. This is probably, however, not the case. In the first place X-ray examination, together with investigation by means of the bronchoscope, renders a correct diagnosis more frequent. Then, again, many cases are found to be due to

occupations involving more or less exposure to pulmonary irritants. The great increase in cigarette-smoking has been blamed, but if this were a cause pulmonary cancer would be a wide-spread disease. It is certainly more commonly encountered in males than in females. The age incidence between the ages of 40 and 60 years corresponds to the age incidence of all cancers. There is no doubt that cases formerly designated primary pulmonary sarcoma were in reality examples of carcinoma.

The tumour in most cases is located in the right lung. In a report of 140 cases made by Vinson (*J. Amer. Med. Ass.*, July, 1936) the main bronchus and the bronchus to the lower lobe on each side are the principal sites of pulmonary carcinoma. There is often considerable difficulty in classifying the tumour, but the squamous cell variety is probably the most common. Spread takes place by the lymphatics related to the bronchi. The pleura may be affected and so give rise to a pleural effusion. The mediastinal glands may become involved. Metastases are common. The brain and the adrenal glands are common sites. Others are the liver, kidneys, bones, and abdominal glands.

The chief symptoms are cough, hæmoptysis and dyspnoea. It is invariably stated by writers on this subject that a dry, unproductive cough is the earliest symptom. The slight experience I have personally had of bronchogenic cancer leads me to believe that dyspnoea is one of the earliest clinical manifestations. In one case, for example, a lady, aged 51 years, began complaining of shortness of breath. This remained her chief complaint for a couple of years. She was told that this was due to her age and advised not to worry about this shortness of breath. In September of the second year she went on holiday and while staying in an hotel she coughed up some blood one evening after dinner. She stated that previously she had been suffering from no very noticeable cough. After a few days the hæmoptysis, which was never at any time profuse, ceased and did not reappear until March of the following year. At the date I was asked to see her, I found that for the past two days she had coughed up quite a large amount of blood during that period at various times. She was X-rayed and the report stated there was a fairly large tumour mass extending outwards from the hilum of the right lung. Shortly afterwards under avertin anaesthesia a bronchoscopic examination was made, and this absolutely confirmed the diagnosis. Here, then, is a case in which dyspnoea was certainly the earliest symptom and in which also cough was never a prominent feature.

There is no reason why dyspnoea should not be an early symptom because sometimes even in the very early stages of a bronchogenic carcinoma the bronchus becomes partially occluded and this sets up a localised emphysema. At any rate in anyone who is past middle age and who suddenly develops hæmoptysis, pulmonary carcinoma should always be kept in mind. Such cases are very

apt to be wrongly diagnosed as physical signs do not help us much, if at all. It is a wise precaution to insist on an X-ray examination of the chest before committing oneself to a definite diagnosis. Even then, should the X-ray picture prove to be still inconclusive a bronchoscopic investigation should be carried out. It is perhaps well to bear in mind that sarcoma of the lung is really a very rare condition and that its diagnosis is not likely to be certain merely after an X-ray examination has been made. Such a tumour gives the picture of a very dense and massive-looking shadow.

The prognosis, while never very good, is to-day not altogether hopeless, provided an early diagnosis of the condition is made. If, on the other hand, a wrong conclusion is arrived at as to the nature of the disease and valuable time wasted in carrying out an altogether erroneous line of treatment then we may expect the affected bronchus to become more or less stenosed, ulceration of the tumour, metastases to the lymphatics in the mediastinum and other complications.

There are three methods of treatment to be adopted in cases of pulmonary carcinoma. These are:—

(1) **Deep X-ray Therapy**:—This form of treatment is not very commendable. The dose necessary to destroy the carcinomatous mass must be so great that there is risk of its producing serious destruction of the tissues in its neighbourhood. In fact there is some evidence for stating that inoperable cases will live a little longer if they are not submitted to irradiation by high voltage röntgen therapy. The treatment, moreover, is not devoid of suffering. It is often painful. In the case cited above, deep X-ray therapy was tried and at the end of six weeks when an X-ray film was made no trace of the tumour was to be found. Whether, therefore, this treatment was a success, or whether other treatment directed towards influencing the blood and tissue conditions accounted for this dramatic result it is impossible to say. Unfortunately the patient developed a condition of severe and painful orthopnoea (due doubtless to complete bronchial stenosis) and died shortly afterwards. There was no autopsy.

(2) **Lobectomy**:—Brock does not advise this procedure in cases affecting the left lung as total excision of either lobe together with dissection of the vessels is much too difficult an operation. In the case of the right lung, however, it may be carried out, but the middle lobe should always be excised at the same time, as this not only enables a more complete removal of the associated lymph nodes, but also because there is very little prospect of the surgeon finding a complete separation of the two lobes right down to the vessels. At the same time this must be regarded as a less serious surgical procedure than the one finally to be considered. It would appear that the death rate is round about 30 per cent., but recurrence is likely to take place. It is quite possible, however, that a small number of cures may result.

(3) **Pneumonectomy**:—This is necessarily a major operation with a mortality-rate of about 50 per cent. It would appear, however, that if the patient is lucky enough to survive the operation the chance of recurrence is much less, and cure, therefore, is more likely to result. Out of a total of eleven cases, Tudor Edwards was able to record six survivors with no evidence of recurrence. It is important, however, that the vessels must be carefully dissected out and the adjacent lymph nodes thoroughly eradicated. Brock maintains that in due time this operation will become perfected, though meantime several of its details still remain to be worked out. As we gain greater experience there is good reason for believing that pneumonectomy will take its place as the only correct treatment for pulmonary carcinoma.

I shall conclude this short account of bronchogenic cancer by quoting the opinion of the well-known South American authority, Dr. Alejandro Reyes (*Revista medica Latino-Americana*, May, 1940). He says: "The clinical picture of this disease presents a polymorphism so varied that it cannot be placed into any semiological scheme. There are functional and physical symptoms which, although they do not belong exclusively to this condition, have a predominant clinical expression, for example, the disproportion between the severity of the functional troubles and the paucity of physical signs. There is also a great discordance between the results of percussion over the different thoracic regions and those yielded by X-ray examination of the chest, as well as by lipiodol bronchography which ought to be carried out systematically in every case. Only biopsy of a piece of the tumour obtained by means of the bronchoscope can permit of an exact diagnosis being made. In attempting to diagnose pulmonary cancer every method of investigation ought to be employed at the same time. Early diagnosis is essential, for without it no treatment is available. There are only two lines of treatment—fusion of the tumour by physical agents (radium and X-rays), and surgical removal either by lobectomy or pneumonectomy. These are mutilating procedures, but they are the most efficacious for avoiding recurrences."—*Medical World*.

Systolic Murmurs.—In his Honyman-Gillespie lecture in Edinburgh last week Prof. D. M. Lyon said that up to the end of last century any cardiac murmur was usually taken to indicate heart disease. Then began a swing in the opposite direction and the study and significance of murmurs became derided. He believed that a balance was necessary. Murmurs were produced when turbulence was introduced into the blood-flow. This could be caused by changes in the speed of flow, or the viscosity of the fluid, and by constriction of the channel. Mere roughening of the surface of the channel did not produce eddying. Mitral systolic organic murmurs varied from soft gentle blowing sounds to loud rasping sounds

according to the state of activity of the heart muscle. The murmur of dilatation was softer and not so well propagated. Tricuspid systolic organic murmurs were relatively rare; they were of higher pitch than mitral murmurs and poorly propagated. In view of the reputation of the tricuspid valve as an escape valve it was surprising that tricuspid murmurs were heard so seldom. At the aortic valve organic narrowing was relatively rare and most systolic murmurs were due to dilatation of the aorta along with thickening of the valve, especially the slight projection of a fibrous or calcified cusp. Pulmonary systolic murmurs were still rarer and most were congenital. Functional murmurs were always systolic except for the murmur of pulmonary incompetence sometimes found in conditions of raised pulmonary blood-pressure. They were mostly feeble and poorly conducted. They were probably found in 3% of all recruits and in 80% of athletes after severe exercise. In children various reports put the incidence at between 10 and 60%. The cardio-respiratory murmur was heard along the left border of the heart and beyond; less frequently over the right side. It often occurred in healthy persons. In quality, it resembled interrupted breath sounds of which it was really an accentuation. An interrupted puffing or whiffing sound was present during the whole of inspiration and might extend into expiration. It was usually heard best with the subject in the upright position and stopped if he held his breath. Exercise increased its intensity which, however, was very variable at different examinations. Haemic murmurs were caused by turbulence due to decreased viscosity of the blood; they were heard at both base and apex but the mechanism must be different—turbulence of the flow at the aortic and pulmonary valves and dilatation of the mitral valve. Haemic murmurs should not be diagnosed in the absence of severe anaemia. When the heart was over-active or too rapid functional murmurs might be heard at the apex. These were common during excitement and in "soldiers-heart." A thrill might be palpable and the first sound appear rough. These features disappeared when the heart-rate fell and must not be taken as indicating mitral stenosis. The murmurs of hyperthyroidism and fever were of the same nature. Pulmonary functional systolic murmurs were mostly faint and poorly conducted and were largely due to slight variations in shape or deformity of the pulmonary vessels; that was apart from cardio-respiratory and haemic murmurs. They were found largely in children and young people with plastic chest walls, and might be produced by pressure of the stethoscope. It was important to remember the subclavian murmur heard beneath the clavicle when the arm was raised.—*Lancet*, Aug. 2 1941.

Pathology of Cardiac Pain.—Some fifteen years ago it became generally accepted that the pathological basis of prolonged anginal

pain (with greater or less shock) was thrombosis in a coronary artery leading to cardiac infarction. Further observations have, however, required a modification of this view. It has become evident that acute cardiac infarction is not necessarily precipitated by coronary thrombosis; where widespread narrowing of the coronary tree already exists, infarction may result from further obstruction by haemorrhage into the wall of the artery, or from reduction of coronary flow as a result of some general disturbance—as, for example, an operation. Moreover, coronary thrombosis may often occur without subsequent infarction if there is an adequate anastomotic circulation. Clearly, therefore, to infer the pathology of the different types of anginal pain is not so simple a matter as was formerly thought. An inquiry by H. L. Blumgart, M. J. Schlesinger, and P. M. Zoll throws some light on these problems. A correlation was made in 355 cases between clinical and post-mortem findings. The coronary arteries were injected, radiographed, and dissected according to the method of Schlesinger. Schlesinger had previously shown that in the absence of coronary disease anastomoses between the coronary arteries, though they exist, are not functionally important even in old age. In seventy-two cases one or more main coronary arteries were occluded or considerably narrowed, yet in none were there symptoms of cardio-vascular disease. In all these it was possible to demonstrate a good collateral circulation which had compensated for the obstructed vessels; no infarction or fibrosis had occurred, and cardiograms when taken had been normal. In cases with effort angina as the primary symptom and without valve disease or hypertension, coronary sclerosis with complete occlusion of one or more arteries was always found, but in others with congestive failure and angina as an incidental symptom coronary sclerosis was absent. Sometimes anginal pain is prolonged, but is accompanied neither by the other clinical symptoms nor by the cardiographic changes of infarction. Blumgart and his co-workers have in such cases failed to demonstrate infarction post mortem. They suggest that the cause is thrombosis or other means of sudden arterial narrowing, or alternatively some event which greatly increases cardiac work; they use the term "coronary failure" for such attacks, which may, however, be followed by actual infarction and should therefore be treated by complete rest. Finally, in forty-five cases of acute infarction fresh coronary thrombosis or occlusion was absent in twelve; this last group showed old coronary occlusion; there was one exception—a patient with cerebral haemorrhage.—*B.M.J.*

Diagnosis of Cretinism.—There is a tendency these days to give thyroid extract hopefully to almost every retarded child when the backwardness is physical, mental or both. What Wilkins and Fleischmann of Baltimore call "lack of critical analysis and an excess of enthusiasm" applied to

cases of dwarfism is doubly unfortunate because it obstructs advances in treatment and may raise false hopes in the parents of a mentally defective child. The list of modern methods for the diagnosis of hypothyroidism as set out by Wilkins and Fleischmann appears formidable, but the "classical" cretin is usually easily recognised at a glance after a little experience. The clinical features of hypothyroidism arising during the period of growth fall into two groups: alterations in bodily structure and alterations in functional activity. The stunting in growth is well known and hypothyroidism accounted for about 25% of dwarfs in the Baltimore series after diseases of bone and cardiac, renal, intestinal, hepatic and metabolic disorders had been excluded. Not only is growth delayed, but the child remains relatively top-heavy, retaining the infant's characteristic disproportionate length from symphysis pubis upwards. The naso-orbital configuration also tends to remain infantile, playing an important part in determining the facies of the cretin. Retardation of osseous development is an important factor in the anatomical abnormalities of the hypothyroid child, but such osseous changes are unfortunately not confined to dwarfs of thyroid origin, although treatment with thyroid will only produce a prompt effect in them. Dental development is similarly affected, but according to Wilkins and Fleischmann a form of epiphyseal dysgenesis is probably the most specific of all the anatomical changes due to hypothyroidism; calcification in the epiphyseal cartilage appears in multiple small irregular foci, eventually coalescing into a single irregular centre. They conclude that whereas structural changes are of great diagnostic value in most cases there is a theoretical possibility that a mild degree of thyroid deficiency may exist throughout childhood without producing any characteristic ones, so that functional activities must be studied as well.

Mental sluggishness and physical inactivity are present in all cases in some degree and some improvement follows thyroid medication. Cardiac output and circulatory rate are constantly diminished, but are difficult to measure. The most valuable laboratory tests seem to be those concerned with basal metabolic rate, serum-cholesterol and urinary excretion of creatine. Lately Tobias and Stockford of Los Angeles have been seeking for the best measure of what they term the "metabolic speed" of children and have carried out a survey of earpal development, basal metabolic rate and serum-cholesterol in 216 children selected at random. From a statistical analysis they find that the level of serum-cholesterol is the simplest and most satisfactory measurement of metabolic activity. This is essentially confirmed in relation to the diagnosis of hypothyroidism by Wilkins and Fleischmann. Not only is the estimation of the basal metabolic rate difficult in the young child of subnormal mentality but there are certain fallacies in the test when applied, for example, to obese children whose body-surface area upsets the normal standards.

The serum cholesterol level offers a sure guide, for in most children with hypothyroidism it lies between 250 and 600 mg. per 100 c.cm. compared with a range of 100-300 mg. in normal children. If other causes of hypercholesterolemia, such as diabetes, nephrosis or hepatic disease, can be excluded; then a serum-cholesterol level of over 300-325 mg. per 100 c.cm. is very suggestive of hypothyroidism.

The urinary excretion of creatine is low in the hypothyroid child but there are great differences in the excretion of this substance in normal children so that as a biochemical observation in the untreated cretin it has little value. A valuable extension, however, of both the serum-cholesterol test and the urinary creatine estimation is found in the results of giving a single intramuscular dose of thyroxine (2.5 mg.). In the hypothyroid child a noticeable decrease in the serum-cholesterol is produced lasting about 40 days, whereas in the normal there is only a slight and transient fall. Urinary creatine rises after thyroxine in the cretin but here again the normal standards are variable. A still further extension can be made by the use of the thyrotropic hormone of the pituitary. Here the average daily output of creatine in the urine is studied for a control period of 1-2 weeks. Thyrotropic hormone in doses of 5-10 units per kg. of body-weight is then injected daily for about 10 days, and the daily excretion of creatine measured. The hormone is then omitted until the excretion of creatine returns to the base level and finally the effect of thyroid or thyroxine on this level is measured. In a child with hypothyroidism, thyrotropic hormone produces no change in creatine excretion or cholesterol level, presumably because the child has no thyroid tissue capable of stimulation, whereas thyroid raises urinary creatine and lowers serum-cholesterol. In one type of control in the Baltimore series both thyrotropic hormone and desiccated thyroid produced changes in creatine and cholesterol levels ("positive"); in another, neither had any effect ("false negative"). A false negative response was found in certain normal children and dwarfs with normal thyroid function, though most of the latter gave a positive response. It is clear that biochemistry offers valuable aid in the diagnosis of the cretin and should be more widely used to prevent mistakes. There is one other line of inquiry which Wilkins and Fleischmann do not mention—study of the anaemia of hypothyroidism and the possibility of a positive reticulocyte response when thyroid is administered to the cretin but not to other anaemic, retarded children. This might prove simpler than the thyrotropic-hormone-creatinine method although not as simple as study of the cholesterol level, itself in many cases quite sufficient to confirm the clinical evidence.—*Lancet*.

Differential Diagnosis in Acute Anterior Poliomyelitis.—Sidney O. Levinson, M. D. Director, Samuel Deutsch Serum Center Chicago.

The differential diagnosis is best considered from the viewpoint of the various stages through which the disease passes.

A. Systemic Stage.—Acute upper respiratory infections, acute pharyngitis, and gastrointestinal disturbances resemble the onset of poliomyelitis. Since the diagnosis of infantile paralysis cannot be made in this stage, no differential diagnosis can be made. The patient should be observed and, if the disease progresses, a definite decision may be made.

B. Stage of Meningeal Irritation:—

1. Conditions associated with neck and back rigidity—

(a) Suppurative Meningitis (meningococcic, streptococcic, staphylococcic, and pneumococcic): the disease is more severe and fulminating. Petechiae may be present. There may be preceding infection of the lungs, ears or mastoids. The spinal fluid is cloudy and contains 1000 or more polymorphonuclear leukocytes; from it organism may be isolated on culture, smear or both. The spinal fluid sugar is diminished or absent.

(b) Infectious Encephalitis: There may be a recent history of measles, mumps, chickenpox, or vaccination against smallpox. Disorientation, convulsions, stupor and coma with spasticity of the extremities are frequently observed. The sugar content of the spinal fluid may be increased.

(c) Toxic Encephalitis: There may be an accompanying pneumonia, dysentery or other acute infection. The spinal fluid usually does not show an increased cell count.

(d) Lymphocytic Choriomeningitis: This disease simulates poliomyelitis so closely that it is almost impossible to make a differential diagnosis except by isolation of the virus from the patient's spinal fluid or blood or by detection of the development of specific neutralizing bodies. It seems that this condition occurs only occasionally in clinically recognizable form and is very much less frequent clinically than is poliomyelitis.

(e) Tuberculous Meningitis: This condition is usually insidious in onset. A history of contact with tuberculosis, X-ray of the chest revealing miliary involvement, and a positive Mantoux test in infancy or childhood are helpful in establishing a diagnosis.

2. Extremity Pains and Tenderness—

(a) Injury: This is frequent in childhood as a cause of pain and tenderness. History and physical examination usually determine the cause of the symptoms. The spinal fluid is normal.

(b) Acute Rheumatic Fever: This is

frequently mistakenly suspected in the presence of an outbreak of poliomyelitis. There is no neck and back rigidity and the pain is associated with movement of the joint. The reflexes are unimpaired and the spinal fluid is normal.

(c) Trichinosis: History of eating uncooked pork, associated gastro-intestinal symptoms, high leukocyte count, an eosinophilia, absence of meningeal symptoms and normal spinal fluid differentiate this disease from poliomyelitis.

C. Paralytic Poliomyelitis.

1. Acute Rheumatic Fever: This condition is commonly confused with poliomyelitis when the pain is so severe that the child refuses to move the extremity. This paralysis, however, is spastic, the muscles fixing the joints to prevent movement in contrast to the flaccid paralysis of poliomyelitis and painless joint movement. The spinal fluid is normal.

2. Other pain and joint inflammation: Suppurative arthritis, osteomyelitis, traumatic arthritis, and epiphysitis produce a pseudo-paralysis. Here likewise there is spasticity of the muscles and resistance to joint motion. The spinal fluid is normal.

3. Scurvy: This also is a pseudo-paralysis with spasticity and resistance to movement. Pressure on the bones is exquisitely painful. There is associated malnutrition, bleeding gums and characteristic x-ray findings in the bones. The spinal fluid is normal.

4. Radiculomyelitis (Guillain-Barre Syndrome): There is paralysis of the extremities, marked pain and tenderness. Very often sensory disturbance may be found. The spinal fluid shows a very high protein content but no increase of cells.

5. Peripheral Neuritis: This may follow diphtheria or other acute infection or some drug or poison which may be elicited by careful history. Usually there are areas of sensory disturbance as well as motor involvement. The spinal fluid is normal.

6. Acute Encephalomyelitis: This is associated with a number of virus diseases. These conditions are more acute and more fulminating than is seen in poliomyelitis. The more severe involvement of the brain is reflected frequently in disorientation, convulsions or stupor. The spinal fluid findings may resemble those of poliomyelitis and absolute diagnosis is frequently difficult without the laboratory identification of the specific virus.

7. Other condition: Birth palsies, spastic paralysis and congenital deformities affecting the gait can all be differential by a careful history of birth and development and by a careful examination.—*I. M. J., July 1941.*

Surgery

Sulphonamides Locally.—A little over a year ago, the local use of sulphonamides had barely begun. Since then clinical reports have been made of its efficacy in conditions ranging from epidermophyton of the toes upwards. But clinical impressions alone are dangerous evidence: the variable factors are many and include the depth and extent of the wound, the tissue affected, the virulence and type of the organism, and the resistance of the patient. These can largely be controlled in animal experiments and it is on such experiment that clinical work can be most securely based. Enough laboratory work has been done in the last few months to indicate that clinical optimism is justified; not only has the local bacteriostatic action of sulphonamides been confirmed, but Colebrook, Fleming, and Reed and Orr have shown that there is no interference with healing processes and that phagocytosis, leucocytic infiltration and the formation of granulation tissue are not impaired even by high local concentrations. Of the three sulphonamide powders usually employed—sulphanilamide, sulphapyridine and sulphathiazole—the last, as Fleming has shown, is by far the most potent against the streptococcus and pneumococcus, and even influences the staphylococcus. But in order to be effective the drug must have access to the organism; wounds never have a smooth even surface—Colebrook likens them to the fjords of Norway—and the concentration of a drug in the deeper crevices will depend on the solubility in the wound-fluids of the compound used. On another page (786) Hawking shows that, thanks to its greater solubility, sulphanilamide will give a very much higher concentration in a wound than sulphathiazole; moreover it diffuses far more rapidly through dead tissues. The solubility, absorption and diffusion of sulphapyridine are relatively so poor that its local chemotherapeutic action is not of much value, although it persists longer in the wounds and has a bacteriostatic action which, according to Fleming, is 25 times greater than that of sulphanilamide; sulphapyridine has no advantages over sulphathiazole and is even less soluble in wound-fluids. Hawking and Reed and Orr have also shown that sulphathiazole is the most powerful drug of the three against gas-gangrene infection, and Hawking suggests that, taking all these points into consideration, a powder containing equal parts of sulphanilamide and sulphathiazole is best for local use. The sulphonamides are thought, by Woods and Selbie, to act by interfering with an essential metabolite of the infecting organism and it is therefore important to get as high a concentration of the drug as possible into the wound. McIntosh and Selbie have shown that in order to get the same concentration in a human wound as they have produced in the wounds of animals it would be necessary to introduce 50 g. of powder. This is not possible; the average wound will only take 10 g. of powder and surgeons usually consider it inadvisable to exceed 15 g. The

powder must be finely divided or it will form lumps which interfere with its solubility. Powder sprays are commonly used, but many surgeons rub the powder gently into the tissues. A level teaspoonful represents 10 g.

Hawking makes it clear that while sulphonamides are being used locally they should also be given by mouth. Locally they penetrate living tissues only to a depth of 2-3 mm.; thus the live tissues round the wound can best be approached through the bloodstream. Reed and Orr have shown that the concentration in muscle is always approximately the same as in the blood, and in treating streptococcal infections a blood level of 5-10 mg. per 100 c.cm. must be maintained, as McIntosh and Selbie have indicated. Blood estimations should be used to check the patient's progress; the technique is so simple that in France they are often done by the nurse. The experiences of Mitchell, Logie and Handley in the Libyan campaign confirm that sulphonamides should be given both orally and locally; they found that patients receiving the drugs by both routes were fitter and showed less local sepsis than others. They suggest that sulphanilamide (15 g.) should be applied to the wound immediately and a further 15 g. introduced at the end of operation. Orally, the patient is given 27 g. in 6 days; doses are temporarily doubled in cases of severe infection. Sulphonamides gave better results they found, than local antiseptics such as eusol and acriflavine; where the response to chemotherapy was disappointing they found the infecting organism to be *Staphylococcus aureus*. In the attack on this organism sulphadiazine seems to promise well: Perrin Long finds it to be slightly superior to sulphathiazole in this respect. Feinstein intimates that sulphadiazine is more effective against *Clostridium welchii* than any other sulphonamide. Its local value, according to Hawking's work, is handicapped by its relative insolubility.—*Lancet.*

Conservative Treatment of Sciatic Pain in Low-Back Disability. John G. Kuhns.—*J. Bone & Joint Surg.* 23: 435 (April 1941).

A description of the conservative treatment and a report of the results in 1000 patients seen for sciatic pain and low back disability during the past ten years are given. By conservative management is meant the use of rest in special positions, support, medications, and physical therapy.

What can be regarded as adequate treatment of the usual cause of low back disability,—a muscular or ligamentous tear in the supporting structures of the lumbar spine and pelvis? It would be reasonable to believe that the treatment would be similar to that applied to muscular and ligamentous tears elsewhere in the body,—that is, rest with the injured structures in a position of relaxation until healing is at least partially completed.

It is possible to secure relaxation of most of the posterior ligamentous structures about the sacrum and lumbar spine by supine recumbency with the lumbar spine flat, and with slight flexion (20 to 30 degrees) of the hips. This has been demonstrated in the cadaver.

The best method of securing immobilization and ligamentous relaxation low in the back is to keep the patient constantly on a firm bed with the entire body horizontal except for slight flexion at the hip joint. This can be secured in the supine position by placing a pillow under the knees, or in the prone position, under the abdomen. Only in the mildest of injuries low in the back is the patient permitted to be ambulatory.

In most instances while the patient is in bed, physical therapy, consisting of the use of heat daily, should be given to the posterior surface of the spine and pelvis to improve local circulation, to relax muscle spasm, to relieve pain, and to hasten the absorption of inflammatory exudates. As soon as muscle spasm and pain begin to subside and the patient can move in the bed without much discomfort, exercises can be given to the patient to teach him muscular coordination so that he may improve the balance and carriage of the entire body and thus prevent further strain. The period that the patient must be kept recumbent varies greatly. Complete recumbency should be continued until pain and local tenderness have almost entirely subsided.

If this study is to be of value it should suggest which types of low back pain will probably be relieved under conservative management: (a) Acute traumatic and chronic postural strains of the low back; (b) structural changes in the vertebra or their contiguous structures. Where structural restoration cannot be expected, as in metastatic malignancies, conservative therapy may prolong function and is a good palliative measure; (c) low back pain from pressure or irritation within or about the spinal canal. In this group conservative treatment may be of little avail; (d) pain referred to the back from other parts of the body, usually the abdominal and pelvic viscera. There were no patients in this series of 1000 cases with low back pain of this type. Here the lesion, which causes pain referred to low in the back, should be treated.—(P. Therapy.)

Treatment of Tendons in Compound Injuries of Hand.—According to Bunnell, the outcome of compound injuries of the hand and the prevention of sloughing tendons, infected joints and osteomyelitis is determined by (1) early operation, (2) thorough debridement and (3) covering of all vulnerable tissues. It is preferable to suture tendons within six hours after the accident, but when all factors (infection, degree of trauma, condition of patient and management) are favorable primary suture of tendons can be successfully done after six hours, in a gradually decreasing number of

cases, up to, but never after, twenty-four hours. Tendons should never be sutured if the wound is already infected, if more than twenty-four hours old or in the presence of too much crushed, damaged, dirt-ground or badly contaminated tissue. The operation should never be done with poor hospital facilities or by an unskilled surgeon. It is preferable to leave a severed tendon undisturbed, repairing it later under good conditions, than to repair it under adverse conditions and make the limb worse. When making incisions, one should take care to avoid crossing flexion creases at a right angle or injuring small nerves. Catgut is the least satisfactory suture material. Fine stainless steel wire number 34 or 35 provokes the least reaction of all suture materials. In the primary repair of tendons, the stitch should be the simplest possible. It must cross some fibers for a spliced effect, but this should be minimal. A core suture is less likely to cause adhesions than one on the surface of the tendon. The smooth glistening epitendon surrounding the tendon should not be even scratched. The suture material should be sunk into the tendon. There should be no slack. Some central necrosis will result from the tightness, but eventually it will be replaced by tendon cells. To prevent tendon ends from pulling apart more reliance should be placed on splinting, with joints flexed to relax the tendons, than on the strength of the suture. In three weeks physiologic union allows removal of the splint, a half circumference plaster of paris. At this time, after tendon union, the suture is withdrawn and irritation from it is obviated.—J.B.J.S.

Staphylococcal Osteomyelitis of the Spine—has been fully described by Wilenski (1934), Kulowski (1936) and Turner (1938). It may be divided into three main clinical types. The first as a rule occurs in children of young adults and is characterized by a sudden onset with the symptoms of a severe bacteremia. The local signs are often subordinated to those of the general infection and the diagnosis is usually obscure, often only being made at necropsy. Treatment in these cases is directed to combating the blood-stream infection, the patient rarely living long enough for the local treatment to become a problem. During the last twenty years at the London Hospital 13 cases of this type were admitted and every one of them died. Necropsy was performed on all of them and death was shown in every case to be due to bacteremia with abscesses in the lungs and other viscera. A correct diagnosis was made during life in only 4 instances, the remainder being labelled retention of urine, appendicitis, acute abdomen and cellulitis of the neck; 3 were treated as pneumonia.

The second type has been ably described by Stammers (1938). The onset is sudden with general malaise and pain in the back. An abscess rapidly forms, which may either point externally or form an intraspinal extradural collection, in which case signs of pressure on the cord become evident and

meningitis may supervene later with fatal results. Drainage of the abscess after laminectomy is probably the best line of treatment in these cases. Stammers reported 3, of whom 1 died. We found 2 fatal cases in the London Hospital records, both of whom died from a terminal meningitis.

The third type is sufficiently rare to make it worth while publishing the following case, especially in view of the fact that the patient had the benefit of treatment with sulphathiazole.—*Lancet, April 1941.*

Head Injuries in Wartime.—By F. Willway, M.D., M.S., F.R.C.S.—(Condensed from "Bartholomew's Hospital Gazette.")

Head injuries may be grouped into major categories as follows:—

A. Open wounds of the head.—(1) Scalp wounds pure and simple. (2) Scalp wounds with symptoms of intracranial lesions. (3) Open fractures of the skull.

B. Closed head injuries.—(1) Simple concussion cases. (2) Cerebral irritation cases. (3) Intracranial hemorrhage cases.

C. Late "problem" cases.—It is clear that many patients will have multiple injuries: in some cases the head injury being the major feature, in others the head injury being mild and the other injuries dominating. The groups listed above will now be considered in more detail.

A.—OPEN WOUNDS OF THE HEAD.—1. *Simple Scalp Wounds.*—Providing there has been no loss of consciousness, these cases will not ordinarily require detention. Momentary stunning will probably not be considered as loss of consciousness sufficient to warrant detention in view of heavy pressure upon available beds. The larger first-aid posts and the minor surgical teams will deal with these cases by excision and suture. Free hair cutting and wide shaving is essential. Three special features may be mentioned, namely: severe hemorrhage, difficulties in closure, and major loss of scalp-tissue. If no fracture exists hemorrhage may be temporarily controlled by a scalp tourniquet and by under-running sutures. Permanent control is secured by accurate re-suturing in two layers. Difficulty in approximation can be overcome by either an S-shaped or tripod extension of the wound; hence the importance of the preliminary wide shaving. Extensive loss of scalp substance must cause difficulty. Such wounds after debridement are best treated by immediate Thiersch grafts, which, when bandaged on firmly, take extremely well. Local anaesthesia will suffice for all cases in this class. Dressings are difficult to apply and uncomfortable to wear in these cases. The wounds should be painted with mastisol or Whitehead's varnish and then left to dry, except skin-graft cases, where the special dressing of tulle-gras, etc., should be used.

2. *Scalp Wounds with Symptoms of Intracranial Lesions.* In the majority of cases the intracranial symptoms will take precedence

and once the scalp wound has been dealt with, this group will then fall into the category of closed head injury. Any severe head injury causes a good deal of collapse, which may last some hours. During this period it is most inadvisable to deal with wounds even though contamination is present (all "raid" cases may be considered to be contaminated). A nice dilemma arises between the natural desire to excise contaminated tissue at the earliest possible moment and the need to leave shocked cases alone. Local anaesthesia makes it possible to excise at an earlier moment than would otherwise be possible. Some American Surgeons press the policy of delay, and say it does not lead to infection if the wounds, once covered, are then left undisturbed.

The problem will arise in the cases in this group and the next.

3. *Open Skull Fractures.*—It is at present recommended to give sulphapyridine to all open head injury cases before the occurrence of symptoms suggestive of infection. As soon as the patient can swallow, tablets of M. and B. 693 are given. Its benefit in certain cases is undoubted.

Open skull fractures may be in one of four groups:

(a) Head injuries with scalp wounds where exploration shows a fissured fracture lying in the depths of the wound.

(b) Head injuries where a compound fracture is immediately obvious but the dura mater is apparently intact.

(c) Gross compound fractures with protrusion of brain substance.

(d) Fractures of the base of the skull which have to be catalogued as open fractures (except the rare posterior fossa fracture).

A fracture of the skull is of paramount importance when it is:—

Compound: Leading to infection of the brain and meninges.

Depressed: Compressing the brain.

A cause of lacerated blood vessels: leading to compression of the brain.

Associated with injury to cranial nerves.

Fracture of the skull may be of diagnostic significance, indicating the site of cerebral damage. Fracture of the skull may occasionally provide a spontaneous decompression. The nasal passages and the fracture is a matter of surgical insignificance, though frequently of legal importance.

It will be noted from the foregoing that fracture is only important in so far as it causes cerebral damage.

Certain features of the four categories listed will now be mentioned:—

(a) The routine treatment for the scalp wound is undertaken, with the necessary measures for the concomitant cerebral damage. No special treatment is necessary for the fracture unless obviously depressed, or

unless focal symptoms or compression symptoms are present.

It is not denied that in some few of these cases there may be a separation or depression of the inner table of the skull only, but in the absence of symptoms immediate interference is undesirable. It is preferable to wait for detailed radiological studies, the electroencephalogram and other special tests.

(b) The group of head injuries where a compound fracture is immediately obvious, but the dura mater is apparently intact, frequently provides gratifying results. The force of the blow appears to have expended itself in damage to the brain-case, while the precious contents may sometimes be singularly little damaged. The principles of wound excision are meticulously applied, the scalp edges being first excised and then the bone edges trimmed away. Comminuted fragments are removed, and it is of no moment if wide skull defects are left. Bleeding is arrested and the dura mater inspected.

Should the dura mater be opened? There are definite indications, one definite contraindication and some doubtful cases. The indications are neurological symptoms of focal cerebral damage, general symptoms of compression—stupor (many patients in this class will be conscious on admission)—or bluish coloration of the dura indicating subjacent haemorrhage. The contraindication is established infection in late cases.

At the inspection of the dura mater small unsuspected lacerations may be found; these are sutured if there is no tension.

(c) Gross Fractures.—These are not necessarily fatal, though the prognosis is certainly much worse. Perhaps 50 per cent may be saved, though not all of these will return as economic members of society. After excision of the scalp edges and free removal of bone, pulped brain tissue should be gently removed by irrigation and suction. The dural edges must not be excised nor retracted, as this is liable to open up the leptomeningeal spaces and to allow a local infection to become generalised. The wound-track in the brain must be gently explored and cleared of debris. Before closure the cortex will be protected by a sheet of amnio-plastin. Drainage of such wounds is a wise precaution.

(d) Fractures of the base of the skull.—There is not necessarily much to do but plenty of scope for external auditory meatus must not be plugged because of haemorrhage or leakage of cerebrospinal fluid; nor should these passages be irrigated or syringed. The external meatus should be gently cleansed with cotton wool mops soaked in spirit by someone who can use a speculum. A wick of gauze in carbolic 1 in 80 may be left in the meatus and a sterile covering dressing applied. Treatment otherwise will be directed to the neurological state, and this is considered under the following sections.

B.—CLOSED HEAD INJURIES.—The importance of making notes at the earliest opportunity should be emphasized. Notes made by first aid parties at the time of observation giving date and time as well as

clinical facts are very valuable. Particular attention should be paid to the state of consciousness, i.e., normal consciousness, conscious but confused, irritable, semi-conscious, some reflexes, unconscious, reflexes lost and deep coma. The cranial nerves can be quickly tested and the condition of the limbs, whether paralysed or normal, and the state of the limb reflexes noted.

Intracranial haemorrhage, which may be remediable, is usually diagnosed by observing a "march of events" in the clinical picture; it is the recorded changes which cause the surgeon to suspect a haemorrhage; hence the importance of accurate note taking.

Simple Concussion Cases.—These cases call for observation rather than treatment. The diagnosis is confirmed in retrospect rather than at the time of examination. It is not possible to be certain that an intracranial haemorrhage has not occurred until the patient has remained well over a period of time which may have to be months. Of course, it is always possible to make a shrewd guess sooner and it is certain that the first forty-eight hours are the most critical.

On the other hand, experienced neurosurgeons can recall cases apparently well and discharged from hospital who have been readmitted on account of haematomata.

Most concussion cases make a rapid and complete recovery. If this does not occur, suspicion is aroused that the case is not one of concussion at all, and some other diagnosis must be sought for. The immediate treatment of concussion is rest and quiet.

Since most cases are almost well next day, three weeks in a darkened room is an intolerable imposition. While prolonged rest is advisable, convalescence must be judiciously managed: books, jigsaw puzzles and wireless allowed if the patient wants them; they may dispel boredom and introspection. Many patients will refuse to rest at all and may suffer no penalty for refusing advice which is clearly only dictated by caution. Perhaps "living dangerously" should not be discouraged at the present time!

A few will develop the post-concussional syndrome (headaches, inattention, anxiety feelings, minor forgetfulness, irritability) and require expert investigation (electro- and/or air-encephalography), or the aid of a psychologist.

The Cerebral Irritation Case.—This is a familiar and not uncommon clinical type. The patient lies curled up, resenting light, any examination, or nursing attention. He is not unconscious and can easily be aroused and sometimes irritated to frenzy. He may be restless, and then a search should be made for non-cerebral irritants. A common example is a full bladder. The bemused patient may keep trying to get out of bed to micturate while the nurse keeps pushing him back, until a fight may develop.

An external irritant will not always be found, but it should always be looked for. Complications in cases of cerebral irritation

include intracranial haemorrhage, bronchopneumonia, urinary infection and bedsores.

Should Dehydration Therapy be Employed?—A few years ago this was a popular routine; at the present time its routine use is condemned. For selected cases and for specific purposes (e.g., cases of general cerebral oedema, to relieve coma for pre-operative diagnosis, to relieve tension temporarily until decompression is possible) it is definitely valuable. Dehydration methods may be classified as slow and rapid. Standard slow methods are: magnesium sulphate in large doses by mouth or 6 to 10 oz. of common salt 20 per cent. solution per rectum, six hourly or p.r.n. If persisted with, symptoms of proctitis may supervene, and the treatment must be stopped.

Rapid dehydration is obtained by either intravenous injections, 30 per cent. sucrose in doses of 50 to 200 c.c. or by lumbar puncture. Diagnostic lumbar puncture with manometry must precede and control rapid dehydration measures.

Dehydration cannot be beneficial and must be harmful if there is intracranial bleeding or damage to cerebral substance; dehydration cannot be harmful and will be beneficial if generalized cerebral oedema is the sole lesion that exists. Thus accurate diagnosis must precede this treatment.

Most cases of cerebral irritation, if the major complications, as previously described, are avoided, will gradually improve and return to normal, or almost normal, in from three weeks to six months. Some cases, however, do not do so; the problem then is to decide whether operative measures should be employed. Exploration is justified if there is any likelihood of a localized haemorrhage, or even if doubt exists in a case where normal improvement is not taking place. In a case where manometry confirms the diagnosis of persistent oedema suggested by headache, irritability, papilloedema, and where control by dehydration is difficult, then a right-sided subtemporal decompression is justified.

Intracranial Haemorrhage Cases.—These form the dramatic cases in head injury work. They are comparable to ruptured spleens and ruptured ectopic gestations of general surgery, in that prompt and fearless diagnosis is necessary, together with effective operative intervention. The comparison holds further in that it is probably safer (in good hands) to operate unnecessarily than to fail to operate in doubtful cases.

Intracranial haemorrhage may be:—

1. Extra dural.
2. Sub-dural: Diffuse, when it is also sub-arachnoid; Localised.
3. Intracerebral: Small, leading to cyst formation; Large, generally fatal.

Extra-dural haemorrhage may occur from the middle meningeal vessels or from the superior longitudinal sinus or from the lateral sinuses.

Sub-dural haemorrhage of the local variety may appear in an acute or chronic form, i.e. symptoms may appear within a few days of the accident, or not until months or years after the accident, when a cerebral tumour may be simulated.

Haemorrhage in the cranial cavity is usually of a progressive nature, and the diagnosis of its presence and situation is more important than the diagnosis of its type, whether extra or sub-dural. The early symptoms are irritative and thus difficult to distinguish from cases in Group B. 2. Suspicion of intracranial bleeding is aroused by noting:—(1) Progressive symptoms, (2) Occurrence of convulsions, (3) Onset of paralysis, (4) Persisting unconsciousness, (5) Pupillary changes, (6) Persistent vomiting.

The site of the haemorrhage is suggested by the presence of scalp bruising or skull fracture (this may be misleading), or by focal symptoms and mode of onset of the paralysis or other symptoms.

Success in diagnosis and subsequent treatment is often due simply to the awareness on the part of the medical attendant of the possibility of haemorrhage. Too often in the past have cases of this nature been allowed to lie in bed to all intents and purposes unexamined, and left to live or die as Nature wills. Knowledge of the pathological processes at work will often enable the surgeon to turn the scales in favour of recovery.

C.—LATE OR PROBLEM CASES.—This is a wide category comprising such apparently unrelated cases as: late epilepsy, cerebral abscess, retained foreign body, persistent headache, cerebral hernia, skull defects, etc.

It is impossible in this article to deal with the diagnostic and operative features of these cases. They will provide the neurosurgeon with his "interesting cases" and tax his ingenuity and skill.—*The General Practitioner.*

Perforated Oiled Silk in the Treatment of Burns.—B.M.J. March 15—41, By R. Stop Forit Taylor F.R.C.S., M.D.

1. A simple zinc paste ointment e.g. Ol. Morrhuac et ung zinci (B.P.) is spread for a breadth of about half an inch on the surrounding skin reaching up to the edge of the burnt area.

2. A sheet of oiled silk, perforated with holes one-eighth of an inch in diameter and half an inch apart is then cut to the size and shape of the burnt area but with an overlap of half an inch to be on the ointment margin. It is sterilized preferably by boiling and spread out and placed direct on the low surface.

3. Dry gauze or a saline compress is put on the top of the oiled silk and the part is lightly bandaged.

4. This dressing should be left quite undisturbed and changed entirely twice a week only when the margins of the burn are cleaned and the oiled silk is re-sterilized and replaced.

5. The gauze may be changed daily, but it is important that raw area should be left untouched during the redressing.

6. As the part heals in from the edges the oiled silk should be trimmed to fit.

The rationale of treatment is the protection given to the growing epithelium and the opportunity provided for it to proliferate, as it should, in its own serous discharge, without interference and without antiseptics.

Treatment of Recent Colles' Fractures

Samuel P. Newman.—Rocky Mountain M. J. 38: 211 (Mar.) 1941.

After reduction, immobilization may be accomplished by using a plaster cast. Plaster immobilization is most satisfactory because the cast may be moulded for the particular case. If a padded cast is applied the plaster may be "pulled on" somewhat snugly.

The site of the fracture should be re-examined by roentgenograms within twenty-four hours after the reduction. If the physician suspects that there has been a loss of position of the reduction, re-examination by roentgenograms should be made.

"Post-reduction care" is as important as the treatment given for reduction. For the first two or three days the patient should elevate the hand at frequent intervals to eliminate swelling. Circulation should be watched and if it has been interfered with, the cast should be split. After the first two or three days the patient should be encouraged to use the fingers and thumb actively in gripping and performing minor duties. These exercises help to overcome stiffness. In elderly patients it has been the custom of the author to remove the plaster cast at the end of sixteen to eighteen days and place the wrist in a neutral position but with continued immobilization for another two weeks. In this change, disturbance in the relation of the fragments should be avoided. Immobilization should be continued until the union is sufficient to prevent the fragments from being displaced by the ordinary acts performed by the person. When immobilization has been discontinued, physical therapy in the form of baking, diathermy and massage may decrease the period of disability. Forceful passive movement should

never be used. If scar tissue is present it should be stretched rather than torn. Active use returns the function of the extremity quicker, and to a more normal degree, than any other procedure. Active motions may be encouraged by having the patient squeeze a soft rubber ball, pick up small objects and so on.

Livedo Reticularis.—Barker and his collaborators report 13 cases of livedo reticularis or peripheral vascular disease. All the patients presented a persistent bluish red mottling of the skin of legs and feet. The mottling extended to the thighs in a few; it involved hands and arms to a less degree, and occasionally the lower part of the trunk. The livedo became more noticeable on exposure to cold, and there was a persistently lowered cutaneous temperature. The age at onset varied from 21 to 47 years. There was no evidence of syphilis, tuberculosis, tuberculous, occlusive disease of the larger arteries, varicose veins or venous insufficiency. Three patients had recurring ulceration of the skin of the legs. This, they stated, began as an intensification of an area of bluish discoloration. The ulcers of 2 were resistant to treatment and all were extremely painful. In the patient with the most extensive ulceration, occlusion of the arteries of each great toe developed on separate occasions. Three patients had a peculiar type of gangrene of the skin of the toes which persisted for several weeks or months and involved the distal half of the toes. In each instance the skin ultimately became black and hard and finally sloughed with healing except in 1, for whom amputation became necessary because of nonhealing and severe pain. A common etiologic factor could not be demonstrated. The clinical manifestations differed distinctly from Raynaud's disease, acrocyanosis or thromboangiitis obliterans. The available data indicate that in livedo reticularis there are usually organic changes in the arterioles of the skin, with chronic vasospasm, which result in regional atony and dilatation of capillaries and slowing of the blood flow. Lumbar sympathetic ganglionectomy performed in two cases definitely improved the circulation and prevented further attacks of gangrene. It was unsuccessful in 1. Sympathectomy seems a justifiable procedure when no definite etiologic factor can be found and superficial gangrene is present.—*A. M. A. Journal.*

Obstetrics and Gynecology

Gonococcal Infections of Women.—By Robert M. Lewis, M.D.

Effective methods of handling gonococcal infections, requiring only 10 to 12 days of treatment, have been developed. Four-fifths of our patients can be cured. Acute or chronic gonococcal cases can be treated effectively without the necessity of hospitalization. In the past, all forms of treatment have been remarkably unsuccessful. The newer sulphonamide therapy returns the

treatment of gonococcal infections to the general practitioner.

Diagnosis.—A careful technique must be observed in taking swabs from the cervical canal or urethra if positive spreads (smears) or cultures are to be secured in any considerable percentage of cases. The patient should not have voided during the preceding hour; the urethra should be massaged toward the meatus and the swab inserted directly into the urethra and turned about

well within its lumen. When taking swabs from the endocervix, use no lubricant on the bivalve speculum. Cleanse the external os and canal with dry pledgets of cotton, and insert the sterile swab well up into the canal. Grip the cervix between the blades 2 or 3 times to express all possible organisms from the lining glands into the cervical canal. If culture plates are not at hand, drop the swab into a sterile tube containing 2 or 3 c.c. of proteose peptone No. 3 broth and transfer this to culture media within 6 hours. As the acute phase of the infection wears off, it becomes increasingly difficult to secure positive spreads; cultures will prove positive more than twice as often.

While positive spreads or cultures are conclusive evidence of gonococcal infection, cultures are not always obtainable. The clinical appearance of the cervix and possible tubal involvement aid in the diagnosis. One may be forced to make a diagnosis on a history of intercourse with an infected partner followed by leucorrhœa and other clinical symptoms. In cases of latent infection, handling the cervix or local application of any irritating material, such as glycerin or silver nitrate may provoke a discharge of latent gonococci. Unfortunately, complement-fixation tests are of little value in making a diagnosis, although a strongly positive complement fixation test which becomes negative as symptoms disappear, suggests a cure. If the test remains positive, gonococcal infection probably still remains.

Local Treatment.—For a long time we have realized that many endocervical gonococcal infections tend to die out in 6 months or less if tubal infection does not intervene. In the past we have credited our methods of treatment with the cure of patients who were, in reality, all curing themselves. I firmly believe that they recovered, not because of our interference, but in spite of it. At present we use no local treatment whatever, but rely on sulphydrydine or sulphathiazole to cure our patients.

Fever Therapy.—A high percentage of cures can be produced by the Kettering hypertherm apparatus or its equivalent. Unfortunately, hyperthermia is time-consuming, uncomfortable and expensive for the patient, as well as dangerous if not administered under the constant supervision of a carefully trained staff. It is indicated in cases in which the sulphonamides have failed.

Sulphonamide Treatment.—Sulphanilamide has no longer a place in the treatment of gonococcal infections; not more than 30 per cent of ambulatory patients are cured with sulphanilamide. Fear of, or the actual development of toxic symptoms, prompted the physician to reduce the dose of sulphanilamide to the point of easy tolerance. As a rule, patients were rather rapidly relieved of their clinical symptoms, gonococci could not be demonstrated by laboratory methods, and the case was only too often pronounced cured before a relapse made him or her an uncomfortable menace to society.

Sulphydrydine or sulphathiazole is given for 12 days in divided doses of 0.5 Gm. every 4 hours, four times daily (not exceeding a total daily dose of 2 Gm.). Hospitalization is unnecessary and there is no need to limit fluid intake. Patients must be impressed with the extreme importance of taking their tablets regularly at the hour advised. Ordinarily, cases of gonococcal endocervicitis under this treatment with sulphydrydine show obvious improvement in from 48 to 96 hours. The purulent discharges decrease very quickly. The cervix, which is usually red and swollen, rapidly assumes a normal appearance. It is uncommon to find either positive spreads or cultures after 48 hours. If no improvement is evident after 5 or 6 days, the sulphydrydine should be stopped for a few days and a change made to sulphathiazole. Frequently, patients appear entirely well by the end of 4 or 5 days; treatment, however, should be continued for 12 days. When the dosage is kept at 2 Gm. per day, determinations of the concentration of the drug in the blood are not necessary because serious toxic symptoms rarely develop. Mild headaches, anorexia or slight nausea are frequent but do not interfere with treatment. We give patients only 8 tablets at a time, enough to last for 2 days. Patients are seen and examined at 48 hour intervals. If toxic symptoms are encountered, or if anuria, hæmaturia or renal pain should develop, treatment is stopped. With larger doses of sulphydrydine toxic symptoms frequently are severe enough to stop treatment and the percentage of cures is hardly greater than with 0.5 Gm. four times a day. Pregnancy is not a contraindication to the use of the sulphonamides, but they are inadvisable in patients with a blood hæmoglobin of less than 50 per cent.

With sulphydrydine, 80 per cent. of apparent cures have been obtained in a large series of cases. In a smaller series of cases (100) with the same dose of sulphathiazole, 90 per cent. of apparent cures have resulted. Since sulphathiazole is less toxic than sulphydrydine, it is apt to supplant sulphydrydine in the treatment of gonococcal infections.

Salpingitis.—A correct diagnosis of acute gonococcal salpingitis is usually made without difficulty from the history and the fact that it is almost invariably bilateral and accompanied by an obvious cervicitis. Cases of acute and subacute salpingitis respond to treatment with sulphydrydine or sulphathiazole in the same doses recommended for endocervicitis. We have treated 6 cases with sulphathiazole. In 2 to 3 days, and at times much sooner, after treatment was initiated, pain and fever nearly or quite disappeared. The relief of pain was commented upon by the patient within 12 to 24 hours. So striking is the improvement that diathermy or opiates need not be used. The tense abdomen quickly relaxes and the patient becomes comfortable. The mass felt on bimanual examination, diminishes and becomes less tender. Old

residual pathology, such as adhesions and malpositions which cause pain, must be dealt with surgically. If a pelvic abscess develops, its evacuation and drainage through the vaginal vault is indicated. If a patient has suffered with former attacks of salpingitis, a supravaginal hysterectomy combined with a bilateral removal of the tubes may be indicated a week or more after the temperature has returned to normal.

Vaginitis of Children.—In a large group of untreated children about 75 per cent. recovered in 6 months or less. Vaginal suppositories of estrogens produced negative smears, but cultures remained positive about as long and as often as in the untreated controls. Sulphapyridine given at 4 hour intervals four times a day cured about 90 per cent. of a series of cases. The dose for a child should not exceed 0.03 Gm. per pound of body weight daily, and should not total more than 2 Gm. per day.

As the sulphonamide drugs come into wider use, we may expect a striking decline in the incidence of gonococcal infections. Failure to respond to sulphanilamide does not mean that sulphyridine will be ineffective.—*General Practitioner*.

Vitamin K Administered During Labor.

—Beck and his associates studied the clotting activity on the first, second and fourth days of life of 200 infants. Vitamin K was given during labor to alternate mothers. The clotting activity of the 100 control infants on the first day of life was approximately 70 per cent of that observed in normal adults. A physiologic fall in prothrombin usually occurred on the second day. This fall at times may reach dangerously low levels. Evidence of hemorrhage was present in 50 per cent of the infants whose clotting activity fell below 35 per cent of normal. By the fourth day clotting values tended to approach the first day levels and usually reach the first day level by the sixth day. A clotting activity in newborn infants approaching that of the normal adult may be obtained on the first day by the prophylactic administration of vitamin K to the mother during labor. Vitamin K administered to the mother during labor also prevents the physiologic fall in prothrombin values. Only 1 infant among the 100 whose mothers received vitamin K during labor had a clotting value on the fourth day of 38 per cent of the normal adult value. Vitamin K given during labor and ante partum should prevent some of the hemorrhages which occur in newborn infants. Only 5, or 0.5 per cent, of 1,022 infants whose mothers received vitamin K showed any evidence of hemorrhage in contrast with 21, or 2 per cent, of 1,037 control cases. Accordingly, vitamin K should be valuable in reducing the incidence of hemorrhage in all newborn infants, and especially so in premature infants or after long labor and operative procedures.—*J. A. M. A.*

Puerperal Sepsis.—By Arthur W. Binham, M.D., East Orange, N.J. Statistics show that one of the chief causes of maternal mortality is sepsis. The treatment of puerperal sepsis is still quite unsatisfactory in spite of sulfanilamide and allied preparations. Therefore, every effort should be made to prevent infection.

Let us consider briefly how the patient became infected.

Perhaps you failed to wear sterile rubber gloves when making a vaginal examination.

Perhaps you failed to scrub your hands thoroughly before using a sterile glove which later was found to have a minute hole in it.

Perhaps you made a vaginal examination before the patient was sufficiently prepared.

Perhaps you were in a hurry to get to the office, and did not take time for the proper routine.

Perhaps you failed to wear a mask while examining and delivering your patient. The mask is especially important if you have a cold.

Perhaps you touched some non-sterile object after putting on your sterile gloves.

Perhaps in a precipitate birth you treated the baby which was lying on a non-sterile sheet then failed to change your gloves before taking a few sutures or treating the mother in any way.

Perhaps you made a vaginal examination at your patient's home without proper precautions to see if she was in labor before going to the hospital. The patient then enters a hospital where all precautions are taken, but she is already septic, and no one knows why.

Perhaps your patient was draped with sterile towels which shifted with every move, making it almost impossible to keep from touching a non-sterile area. Patients should be draped so that this cannot occur. Care should be taken not to touch the drapes, especially if they are wet.

Perhaps you were obliged to deliver your patient in a dirty room unfit for such work. Such patients must be educated to go to a hospital or maternity home properly equipped for maternity cases.

Perhaps the "Sterile" equipment used was not really sterilized.

Perhaps you allowed your patient to continue too long in labor before doing a cesarean. The best time to decide to do a cesarean is a short time before labor starts. More preventive prenatal care, with closer study of the case, will help.

Perhaps in a case of hemorrhage in the home, in the emergency you tried to pack the uterus or vagina without having the proper sterile supplies or instruments.

Perhaps many a break in technic has brought no serious results; but is that any excuse to be careless when the majority of cases of puerperal sepsis are caused by such

Perhaps your patient infected herself either from outside, or from an existing infection—a ruptured appendix, gall-bladder, tubo-ovarian abscess, tonsillitis, or infected teeth. This so seldom happens that it is only a minor cause of puerperal sepsis.

When puerperal sepsis occurs, it is the attending physician's duty to check every step taken and see where a break in technic may have occurred, so as to prevent it next time.—*Jour. Med. Soc. N. J. June 1941.*

Estrogenic Hormones in the Treatment of Gonorrhœal Salpingitis.

—The use of estrogenic hormones in the treatment of gonorrhœal salpingitis is based on the view that at the time of menstruation the estrogenic hormone level is lowered and consequently the tubes are deprived of the beneficial action of the hormone, with resulting lowered resistance to gonococcal invasion. A series of cases treated by injection of estrogenic hormones is reported by Geza Weitzner (*American Journal of Obstetrics and Gynecology* January, 1941, 41, 92). The patients were divided into two groups, group 1 comprising cases of chronic salpingitis, and group 2 acute salpingitis. The dosage decided upon was 30,000 international units of follicular hormone, divided into three doses and given by the intramuscular route at the onset of menstruation; in the acute cases a daily injection of 10,000 international units was given. In the first group seventy-four patients were treated through six to ten periods; during the time of treatment there was no recurrence of salpingitis, the patients steadily improved, gynecological examinations showed a gradual decrease in size, and in some cases complete disappearance, of the adnexal swellings, and two patients became pregnant. In a control group of twenty patients treated with distilled water injections at the time of menstruation twelve showed gradual improvement, two suffered an acute attack of salpingitis, and six complained of stationary or increased discomfort. In the second group of patients with acute salpingitis two sub-groups were formed: (a) The menstruating group, who were treated by three injections of 10,000 international units of follicular hormone at three-day intervals at the time of menstruation during hospitalization. Fifty-four patients received this treatment and of these 70 per cent had normal temperatures during and after their periods. In some cases a daily injection of 4,000 international units was given in place of the 10,000 international units at three-day intervals; the results in these cases were slightly better. In a control group not receiving hormone treatment 70 per cent continued to be febrile. (b) This sub-group consisted of thirty-seven patients with constantly high temperature and whose attacks of salpingitis did not follow a short term course. These patients were given daily injections of 10,000 international units of estrogenic hormones, resulting in marked and occasionally dramatic improvement.—

Glucose-Insulin Treatment in Hyperemesis Gravidarum.—Delmar F. Bice, M.D. Yakima, Wash.

Pernicious vomiting or hyperemesis gravidarum is a toxemia of early pregnancy and is characterized by nausea, vomiting, dehydration, ketosis, starvation, hepatic derangement and neurosis.

There have been many theories advanced in an attempt to prove the cause of pernicious vomiting but no single one has as yet been fully accepted.

Katz and Kaufman contend that it is a cortico-adrenal insufficiency; J. William Finch holds to an allergic reaction of the patient to secretion of her own corpus luteum. Also there are those who feel the cause to be toxins of fetal origin, gastrointestinal origin, or even disturbance of endocrine balance. There are dozens of other theories by various authorities but again evidence is insufficient for proof.

The carbohydrate deficiency theory as applied to hyperemesis gravidarum was first suggested by Ewing, Rand and Underhill in 1910 and a few years later Titus and Harding and Duncan elaborated on this treatment. However, regardless of the origin of the trouble, it is a recognized fact that there is profound disturbance in carbohydrate metabolism and that this is directly responsible for the symptomatology of pernicious vomiting. It is a generally accepted fact that toxemia is the result of some disturbance in the maternal metabolism. I believe that any other abnormal condition, such as endocrine imbalance, gastrointestinal disturbance, allergic reactions or fetal toxins only serve to aggravate the already unstable or disturbed carbohydrate metabolism of the pregnant patient.

It has been definitely proved that the nutrition of the fetus is dependent on glycogen that is stored in the placenta until the fetal liver assumes its physiologic functions. This sudden and increased demand for glycogen by the fetus and uterus is often more than can be supplied by the mother. If, at this same time, there is enough nausea and vomiting to interfere with ingestion of the proper amount of carbohydrates in the maternal diet, the exogenous carbohydrate supply will be insufficient to meet the increased demand for glycogen and thus the maternal hepatic glycogen stores must necessarily be utilized to meet this deficiency. By this process the maternal liver is robbed of its glycogen, which is already at a low ebb during pregnancy. Thus with these two actions taking place simultaneously, that is, lessened intake of glycogen and increased consumption on the part of the placenta and fetus, the liver is very soon depleted of its glycogen. It is then not able to perform its detoxifying functions efficiently and the various toxic substances in the body, which ordinarily would be neutralized under normal conditions, are now allowed to circulate, develop and produce toxemia. Thus a vicious

there is a lessened ingestion of carbohydrates; there is a growing demand on the part of the fetus for more glycogen, and the depleted liver becomes less and less able to supply or retain its glycogenic store or to perform its detoxifying functions. This leads rapidly to the condition known as hyperemesis gravidarum.

In this condition we find a liver depleted of its glycogen and it now begins to undergo fatty degeneration. This is followed soon by necrosis. These two changes are the most constant and characteristic of any postmortem findings. This pathology is believed to be due more to starvation than to any specific toxin. It has been shown by Opitz that similar lesions can be produced by prolonged starvation. The blood chemistry in these toxic cases coincides closely with degree of toxicity and the hypoglycemic tolerance curves of the toxic patient are quite analogous to those found in cases of starvation. Other body tissue changes such as fatty degeneration of the convoluted tubules of the kidneys and fatty degeneration of the heart muscle I believe to be of secondary nature and a result rather than a cause. There is frequently present oliguria or even anuria due to the restricted intake

or vomiting of fluids. The urinary excretion of ketone bodies is diminished and ketosis is established. Waste products are retained and the serum nonprotein nitrogen levels are exceedingly increased, due to the renal insufficiency and dehydration.

A perusal of literature reveals that a similar form of treatment has been tried by various authors. As early as 1924 Thallniner, Lequax and Laudot at the Society of Gynecology in Paris tried a similar treatment. Their method was to give 250 cc. glucose in saline intravenously twice daily and when the injection was half given to inject ten units of insulin. Barkelmann and his student Reinicke used the same in 1935 and 1936 with good results. In 18 cases reported by Waters vomiting ceased in 24 hours; 14 of his 18 cases improved upon the first insulin injection.

In three of my cases I mixed my insulin, ten units in a liter of 10 per cent glucose in saline and gave the combination intravenously but I believe my best results have been obtained by increasing the sugar content to a maximum and then breaking down by subcutaneous injections of insulin.—*North-west Medicine.*

Ophthalmology

Physical Measures in Ophthalmology.—

By Oscar B. Nugent, M.D.; F.A.C.S., Chicago, Illinois.

Physical therapeutic agents employed as aids in the management of certain diseases of the eye and its adnexa are the same as those used to treat diseases of the body in general. Applicators, electrodes, and especially the technique must be modified, however, to suit the comparatively small and delicate structure of the eye.

Among the agents considered in this discourse are *cold* and *heat*. Cold is a reduction in electromagnetic activity. Heat is generated by different wavelength activity in the electromagnetic field to suit the particular type of tissue to be treated. The most common sources of heat for therapeutic purposes are infra-red and diathermy.

Phototherapy consists of ultra violet, which can be administered in local or general applications, Grenz' Ray generated in heated cathode vacuum tubes, therapeutic roentgen ray and radium. All are applicable to certain eye diseases. Exercise, massage and manipulation are used to a limited and somewhat modified degree. Electro surgery has come to be a most interesting and practical branch in the field of physical agents.

Cold Therapy:—The treatment of certain conditions in the eye and its adnexa by application of cold is of great value, and if used in proper form, gives most satisfactory results. The application of an ice bag in blunt injuries of the eye, where there is much contusion and little or no hemorrhage, will serve to prevent an ecchymosis and subsequent swelling and edema. It is of great benefit

if applied following the use of strong caustics in the conjunctival sac, such as Silver Nitrate, Copper Sulphate, etc., also following strabismus surgery, enucleation and evisceration. An excellent method of application is to fill a surgeon's rubber glove with the fingers tied off with cracked ice. This forms a thin rubber sack and gives better application of cold than ice bag, which has a thicker rubber wall.

Heat Therapy:—Heat has long been recognized as a valuable agent in the treatment of many body diseases and conditions. It is described under the heading of surface heating, such as hot applications and infra-red and heating of deep tissues by means of diathermy. Heated salt and flannel are old home remedies. The hot water bottle is a comparatively more recent means of heating skin surfaces. The wet pack also is an efficient means of heating surfaces of the body, particularly so where moist heat is preferred to dry heat.

Radiant heat obtained from an incandescent light bulb of high wattage, with a good reflector, is a good way to use heat therapeutically in the home with little trouble and minimum cost. The infra-red generator serves the same purpose. During the treatment some of the heat is necessarily carried away by the lymph and blood; but the constant application of heat from the generator keeps up a steady uniform radiation over the surface being treated.

The advantages in the use of infra-red over the other methods are; (1) Its cleanliness; (2) it can be administered without risk of infecting the wound; (3) there is no direct contact with the lids and no pain from

undue pressure, such as may occur in the use of the hot water bottle; (4) there is less demand on the nurse's time as, once it is properly placed, it requires very little further attention.

The length of treatment is from 15 to 30 minutes, depending upon the degree of heat necessary and the patient's tolerance.

The conditions and diseases for which infra red is indicated are: Inflammation; infection, such as sub-acute and chronic conjunctivitis; hordeoli; meibomian inflammation and infection; purulent dacryocystitis; acute dacryocystitis; acute iritis and corneal ulcers.

Diathermy.—This will be discussed under medical diathermy and surgical diathermy. The former is used primarily for heating deeper tissues. This is accomplished by passing an alternating high frequency current through the tissue which generates heat by virtue of the tissue resistance to the current. The current is generated in different wave lengths. (The conventional type of diathermy in wavelength is from 300 to 200 meters; the short wave from 200 to 50 meters; and the ultra short wave from 50 to 5 meters.)

The method of application of non-surgical diathermy is varied and has changed considerably during the past several years. It will not be necessary to describe the evolution of the electrode, as that can easily be obtained from the literature. The best electrode thus far devised for eye work is the glass or plastic enclosed electrode. It is the safest, most sanitary and most efficient, and is of service only when the short and ultra short wave currents are used.

In using the diathermy current on the eye, great care and precaution should be used to avoid ill effects which may result from overheating. Gifford suggests that the temperature in the eye should not be raised over 105° Fahrenheit; but in the present methods of administering short wave diathermy, there is no precise method of knowing just what the temperature reading may be during the treatment.

In Bachem's experiments, he concluded, in short, that the tissue in the space between the two electrodes is heated more in the center, and that toward the edge of the electrode the heat did not rise as high, and that the space directly between the electrodes reached a higher degree than on the skin. I think it would be well to keep this fact in mind when planning the dosage.

A good method to follow is to give not more than 15 minutes treatment-time and to keep the heat within the limits of the patient's own comfort. In so doing, one may, at times, not give as much treatment as would be to the best advantage to the patient; but one may avoid doing injury to the tissue, which is more important. After treating a number of cases, one soon learns how strong a current is best suited to any particular disease by the immediate reaction of the patient and by the results ultimately obtained.

Although I have never been convinced, from my personal observations, that there

were any changes in the size of the retinal vessels as a result of the application of short wave diathermy, many observers have found that the blood vessels of the retina were larger in caliber. It has been shown by Punttenney and Osborn, by photographic methods, that in their experiments on dogs, the retinal vessels are not changed in caliber, either during or after its administration. Experiments have shown that during the treatment of a local character, the body temperature rises; but never higher than 3° Fahrenheit under that of the tissues under treatment.

The physiological action of short wave diathermy is summed up briefly by Kovacs as follows: 1st, hyperemia. 2nd, analgesic action. 3rd, antiphlogistic. 4th, bacteriocidal. 5th, lethal action on tumors. These effects should be kept in mind when planning a treatment with the short wave.

Indications for short wave diathermy in the eye are as yet controversial. Authors have different opinions, the results of their own observations; but the evidence from the literature would be in favor of such conditions as chronic irido-cystitis, deep inflammatory condition of the lids, acute dacryocystitis, diseases of the fundus affecting the blood vessels, orbital cellulitis, etc. The results in the treatment of acute iritis, affections of the vitreous, choroidal changes and many other conditions are as yet much disputed.

Ultraviolet Irradiation.—Ultraviolet has been suggested for many conditions of the eye, and I believe, generally speaking, ultraviolet is indicated in broken and necrotic conditions of epithelial surfaces. Its use is more beneficial in the more superficial necrotic areas; but I believe it is of benefit in the deeper ulcers as well. Deep ulcers do not heal readily from any type of treatment and simple ulcers often heal spontaneously. Therefore, naturally, one is prone to accept the theory, advanced by some, that small superficial ulcers are the only ones which respond to ultraviolet ray therapy. I have used ultraviolet radiation in the treatment of corneal ulcers for more than 14 years, for blepharitis for about 12 years, and am still as enthusiastic over its use as I was at the outset.

Ultraviolet application is quite safe if certain known facts are observed. There can be little possibility of injury to the tissues, although quite recently Cipallaro has emphasized the dangers in the use of ultraviolet, and claims the bad effects of over-exposure to the rays of the sun vary from a simple sunburn to cancer formation. This, however, should not require our time or attention in its consideration, in as much as the use of ultraviolet on the eye and its adnexa is not sufficiently strong or applied over a sufficiently long period to produce these ill effects.

Any of the accepted generators will suffice for the treatment where ultraviolet is indicated. The only difference in many of the devices now on the market is flexibility and their adaptation to the administration of the

ray in certain conditions. Indications for the use of ultraviolet are corneal ulcers, superficial and deep ulcerative blepharitis, phlyctenulosis and trachoma. General ultraviolet radiation is said to augment the effects of calcium salts when given either by mouth or intravenously. Its use following the administration of 10 c.c. of a 10% solution of calcium gluconate accelerates its action. This combined treatment is indicated in cases of intra-ocular inflammation with exudate, such as plastic iridocystitis and sympathetic ophthalmia.

Röntgen Therapy.—Röntgen rays are useful in some conditions of the eye and its adnexa. Gifford mentions keratitis, dendritic keratitis, and superficial punctate keratitis, giving 80 to 90 roentgens of unfiltered radiation with a current of 100 kilovolts. Blepharitis has also responded favorably to the roentgen ray. The cornea should be protected with a lead shield or a mercury filled glass shield, and from 80 to 90 roentgens administered at two-week intervals. Roentgen therapy is indicated also in new growths of lids and following enucleation of the globes for malignant neoplasms.

Grenz ray therapy has been repeatedly mentioned in the literature as having beneficial therapeutic effects on certain ocular diseases. These do not penetrate deeply and are absorbed in superficial tissue. They are of electro-magnetic oscillation, having a wave length of about 2 angstrom units and are also called Bucky rays, after Bucky, who first described their value as a therapeutic agent. Their action is similar, in some respects, to that of the X-ray. They are generated in heated cathode induced for a period of 5 hours and given weekly. Preceding each treatment, an injection of vacuum tubes, similar to the x-ray, but by means of a current with much lower voltage.

The Grenz ray is used in the treatment of corneal ulcers of various causes, scleritis, episcleritis, and non-ulcerative keratitis. Gallardo, and others, have recently reported on their work with the Grenz ray and stated that their experimentation did not prove conclusively whether the Grenz ray would kill or injure bacteria within the corneal tissue.

Radium therapy has been proved to be of value in malignant tumors of the lids and has been used for glioma, carcinoma of the choroid and epithelioma. Benign conditions such as chalazion, interstitial keratitis, and spring catarrh have responded to its application.

Surgical diathermy in ophthalmic diseases and new growths, both benign and malignant, has proved its value. Too much cannot be said in its favor for the treatment of various eye conditions. Some of the surgical currents appropriate for use in ophthalmology are:

1. **Electrodesiccation:** This is best produced by current of rather high voltage and low amperage. It can be obtained from the longer wave length currents with or without an indifferent electrode; or by the use of the short wave high frequency current, in which case a dispersive electrode is not necessary.

2. **Electrocoagulation:** This is best produced by a current of comparative low voltage and high amperage, the electrode being allowed to penetrate as deeply into the tissue as is necessary to destroy the offending tissue.

3. **The Cutting Current:** This resembles the electrocoagulating current in many respects.

4. **Electrolysis:** This is performed with a direct galvanic current, and a fine needle electrode attached to the negative pole of the dry cell; or the galvanic current generator and an indifferent wet electrode attached to the positive pole and placed on the skin in order to complete the circuit.

Removal of the new growth, either malignant or benign, from the lids and surrounding tissue is easily accomplished with the indicated current. Some of its advantages may be tabulated as follows: (1) Simplicity; (2) only the offending tissues need be removed; (3) the application of the current to the pathological tissue is accurate and exact; (4) cosmetic results are best; (5) no pain during the operation and no post-operative pain or discomfort; (6) no sutures; (7) no after dressings; patches or bandages; (8) no bleeding; (9) malignant growths can be completely destroyed; (10) lessened tendencies to metastasis; (11) a very high percentage of growths can be removed in the office; (12) rapid healing; (13) no sutures to remove; (14) no guessing.

The beginner should proceed slowly and should exercise caution in order to avoid difficulties. It requires time to master technique, but this can be done more satisfactorily from actual practice than from reading. The operator must be careful of overdosage. It is better to undertreat at first until complete familiarity is had with the apparatus and its various applications.

A few of the many uses of short wave, conventional diathermy current, and galvanic current will be mentioned. The removal of warts from the lids, nevus, granuloma, misplaced cilia in trachiasis, epithelioma of the lid or conjunctiva, pannus, inflamed and infected meibomian glands, cysts of the glands of Moll or of the conjunctiva, pterygium, and other conditions are best removed by electrocoagulation.

This current has also been used in treatment of keratoconus and serpiginous ulcers, which have hitherto been treated with the electro-cautery. Infected lacrimal sac in infants have been completely destroyed by electrocoagulation.

It can only be mentioned in passing, that electrocoagulation is used in detached retina with perhaps the best results of any other agent. Sanile spastic entropion can be best corrected by using the electrocoagulating current, making multiple coagulations in the lid near the ciliary margin.

Fever Diathermy.—Gifford states that this type of therapy is not without danger and should not be used on milder cases which will respond to less severe methods. Fever therapy merits a trial when other methods fail. It is contraindicated in elderly or debilitated persons, in hypertension and in myocardial disease.

According to reports, there are three types of eye affections which respond favorably to ever therapy: 1st, Gonorrheal ophthalmia in the adult. The temperature should be raised to 107° Fahrenheit and maintained for 5 to 10 hours. It is gratifying to note that the swelling and secretions soon subside and the smears are negative. 2nd, Interstitial keratitis. A temperature of 104° Fahrenheit should be produced for a period of 5 hours and given weekly. Preceding each treatment, an injection of bismarsen should be given. 3rd, Atrophy of the optic nerve due to syphilis of the central nervous system. A temperature of 105° Fahrenheit for 5 hours, repeated once a week and each treatment preceded by an injection of bismarsen.

Conclusions.—Physical therapy has a wide field of application in ophthalmology. It should not, however, be employed to the exclusion of recognized procedure, but merely as an aid. Its contraindications must be thoroughly recognized and its limitations appreciated. Physical therapy is far from being a panacea, but those who have had experience with it have found that it frequently hastens results by augmenting the effects of accepted orthodox procedures. Scientific physical therapy has greatly enhanced existing management of a number of ophthalmic conditions.—*Eye, Ear, Nose and Throat Magazine.*

Ocular Lymphogranuloma Venereum.

John P. Macnie. Arch. Ophth., Chicago, 25: 255—279, Feb. 1941.

The author reviews the literature on venereal lymphogranuloma and on the ocular manifestations of the disease. He discusses the stages of the disease, the constitutional symptoms, various names applied to the disease, distribution of the disease, etiology, properties of the virus, immunology, transmission to animals, pathology, differential diagnosis, and treatment.

Cases of venereal lymphogranuloma have been reported showing conjunctivitis, retinal hemorrhages, episcleritis and peripapillary edema, as well as dilatation, tortuosity, or dark coloration of the retinal vessels.

Nine cases of Parinaud's oculoglandular syndrome in patients infected with the virus of venereal lymphogranuloma have been reported. In four of these the conjunctival secretion or excised conjunctival tissue has been shown to contain the virus.

A series of 30 patients with keratoconjunctivitis and uveitis were subjected to the Frei

test. Of these, 4 had positive reactions and were found to have rectal symptoms consistent with venereal lymphogranuloma. Other pathologic conditions in all 4 could have accounted for the ocular symptoms, but venereal lymphogranuloma was a possible etiologic factor in 3 of the cases.

Successful inoculations of animal eyes with the virus of venereal lymphogranuloma and successful transfer from eye to eye by means of infected aqueous humor have been reported. Infected aqueous humor has also produced characteristic meningo-encephalitis in white mice, and antigens from these infected brains have given positive Frei reactions. Granulocorpuscles have been reported in scrapings from the posterior surface of the cornea of experimentally infected eyes.

An experimental study with animals was undertaken in an effort to confirm the foregoing findings. The virus used was isolated from human glandular material in August 1933. During the course of this study the virus was maintained in tissue cultures consisting of embryonic guinea pig in serum ultrafiltrate and by intracerebral mouse inoculation. The author reports the following findings: (1) Keratitis and uveitis were produced in the eyes of 13 of 19 guinea pigs by injecting infected mouse brain antigen into the anterior chamber. (2) The infection could not be introduced into other guinea pig eyes by transfer of aqueous humor. (3) Some of the same aqueous humor inoculated intracerebrally produced the symptoms of venereal lymphogranuloma in white mice. (4) Infected aqueous humor was introduced into a tissue culture, and an antigen from this culture produced a positive Frei reaction. (5) Tests for cutaneous sensitivity in 9 infected guinea pigs yielded 4 positive, 2 doubtful, and 3 negative results. (6) Smears from the iris and posterior surface of the cornea of infected guinea pig eyes, when stained according to the Giemsa method, showed structures of varying size resembling the elementary and initial bodies of trachoma.

The author says that there is no thoroughly satisfactory treatment for venereal lymphogranuloma. Reports have appeared in the literature of the use of antimony, gold, copper, and iron compounds; of salicylic acid and potassium tartrate; of foreign protein, heat, and ultraviolet radiation; of surgical incision and excision of glands, and of dilatation or colostomy for stricture. Sulfanilamide and its related compounds seem to be valuable in this disease.—*V. D. I.*

Dermatology

Vitamin Therapy in Dermatologic Practice.—THOMAS S. SAUNDERS, M.D., Portland, Ore.

The use of vitamins as specific therapeutic agents, or as adjuncts in many medical and surgical conditions has been well-defined and well-publicized. It is my purpose to describe some of the newer clinical and experimental

studies on vitamins, as affecting dermatologic thought and practice.

Progress in vitaminology, from a dermatologic standpoint, has been necessarily retarded by a dearth of clinical material. Frank avitaminoses, pellagra and scurvy included, are rarely encountered in ordinary dermatologic practice. Our knowledge of

specific effects of vitamins on skin diseases has been greatly augmented by contributions of a few authors with extensive observations of large numbers of undernourished people.

In spite of, or rather probably because of, a lack of clinical avitaminoses, dermatologists and others have been trying to demonstrate the value of vitamin therapy in miscellaneous conditions, in which there are no apparent vitamin deficiencies.

Although vitamin deficiencies seldom occur singly, most of the recent studies on vitamins have dealt with individual vitamins or fractions, so it is probably better to consider the vitamins as more or less separate entities.

VITAMIN A.—Dermatologic interest in this vitamin was aroused by a report of Loewenthal in 1933, describing abnormal dryness and scaling of the skin, and follicular hyperkeratoses in 130 subjects in India, whose diet (on analysis) was found to be deficient in vitamin A. Many of these also had ocular symptoms (night blindness and xerophthalmia). With the addition of one ounce of cod-liver oil daily to the diet, all cases with ocular symptoms were cured in nine weeks, and 98 per cent of the subjects with the skin condition. Frazier and Hu reported essentially the same condition occurring in 180 Chinese.

Youmans and Corlette described the same condition occurring in this country. They considered the prompt response to vitamin A therapy as identifying the causative factor of the dermatosis.

There is a fairly large group of dermatoses characterized by follicular hyperkeratoses: pityriasis rubra pilaris, keratosis follicularis, ichthyosis follicularis, keratosis pilaris; generalized ichthyosis, just to mention some of them. Most of these conditions are infrequently encountered and very refractory to treatment. It is quite possible that avitaminosis A is actually one of these conditions, but the descriptions offered by these observers does not indicate it. Nevertheless, we await reports of clinical use of vitamin A in these diseases.

In addition, there are a few miscellaneous conditions in which the use of vitamin A was said to have had a favorable effect. Mackay found that a group of babies, who received extra vitamin A, had less diaper dermatitis and intertrigo than a control group on normal diet. Raedelli reported that infants with weeping eczema showed improvement during administration of vitamin A. Reiss called attention to perleche-like condition in avitaminosis A. Sternberg and Pillsbury concluded that avitaminosis A in rats had no apparent effect on the resistance of the skin to experimentally produced infection with streptococci and staphylococci.

VITAMIN B.—The vitamin B "complex" is made up of some important components (thiamin hydrochloride, riboflavin, nicotinic acid) and other minor factors. It has been indicated (Russel) that administration of crystalline vitamin B₁ hydrochloride alone is of great value in the treatment of anorexias. Our chief interest in vitamin B₁ lies in its

unquestioned value in the various neuritides (polyneuritis of pregnancy, neuritis in pellagra, postalcoholic neuritis and beri-beri).

While I have found the use of vitamin B₁ (complex) of value in stimulating appetite, its use in the treatment of the neuritis with which I am most concerned (herpes zoster) has been disappointing. In three cases in which I recently employed it (vitamin B₁) the results did not differ from those in which other forms of treatment had been used. Rattner and Roll reported similar results in sixteen treated cases.

The use of thiamin chloride in relieving the neuritis and of nicotinic acid in relieving dermatitis of pellagra are by now too well known to require any further comment. I cannot find in my records any cases of pellagra encountered in private or dispensary practice in my two and one-half years in Oregon.

In this connection, I might mention that I have encountered many cases of eczematoid dermatitis, involving the hands and forearms, in which, judging from the vitamin therapy which had been prescribed, some element of pellagra was considered to be present. Naturally, there was no response to such therapy in these cases.

Madden stated that administration of vitamin B, along with a diet restricted in fats and proteins, was of value in the treatment of Psoriasis. In a more limited experience, I have found it inferior to local therapy with chrysarobin, ultraviolet light, etc.

VITAMIN C.—Aside from its great value in prevention and treatment of scurvy, vitamin C has lately been shown to be intimately connected with pigment and pigmentary disorders of the skin. It has been shown that the adrenal glands and the skin are the great storage depots for vitamin C in the human body. In the skin, it is encountered, for the most part, in the basal layer of the epidermis, and hyperpigmented structures are reputedly rich in vitamin C.

The chemistry of vitamin C and its relationship to pigment physiology is of some importance. To begin with, it is a strong reducing agent, a rough test for the detection of its presence being its ability to reduce silver nitrate, with the formation of the black silver oxide. Experimentally, the cut section of the adrenal gland in normal guinea pigs strongly reduces silver nitrate, whereas this reaction is greatly diminished in scorbutic guinea pigs, or in those fed on C deficient diets.

The formation of pigment in the skin depends on the ability of certain cells (melanoblasts) to produce it, apparently through the oxidation of certain organic substances, of which di-oxy-phenyl-amine (dopa) may be chiefly concerned. All pigment-producing cells stain black with dopa reagent. It is assumed that oxidative processes occur in the cell, producing pigment from dopa. Vitamin C, by virtue of its location in the pigment-producing areas of the skin and its strong reducing action, might be able to prevent oxidation and subsequent pigment formation.

This hypothesis was tested experimentally

in castrated guinea pigs, to which estrogenic substances were administered. This procedure ordinarily causes enlargement and pigmentation of the nipples and areolae. The administration of vitamin C in large quantities before and during administration of estrogenic substances did not prevent hyperpigmentation of the nipples and areolae.

Others, however, have reported that the administration of an adequate amount of vitamin C decreases the pigmentation in guinea pigs, resulting from an exposure to ultraviolet rays. Cornbleet found that human skin, after ultraviolet irradiation, contained less vitamin C, as measured by the rough silver nitrate test, than symmetrical nonirradiated areas. A chemical reaction between the ultraviolet rays and vitamin C was postulated. Cornbleet further found that the reaction to silver nitrate from the cut section of Negro skin, previously injected with vitamin C, was greater than the reaction from the cut section of fair skin which had been injected with a similar amount. This indicated to him that pigment had something to do with "binding" or "fixing" vitamin C in the skin.

Conversely, he showed that when vitamin C was injected into leukodermatous (depigmented) areas, the reaction of the cut surface to silver nitrate was negative. Something happens to vitamin C in leukoderma; it is either rapidly absorbed when injected (unlikely) or chemically changed. This experiment indicated that it is difficult for vitamin C to remain in the skin without the presence of some pigment.

In order to comprehend the relation of vitamin C with pigment physiology, it is necessary to consider another factor, the element copper; which has been shown to be present in the skin in direct proportion to its pigment content. Copper apparently acts as a catalyst in pigment formation. When it is added to dopa and exposed to ultraviolet lights, there is a greater precipitation of pigment than when dopa alone is exposed. Vitamin C, when added to a mixture of copper and dopa, and similarly exposed, was found to have an inhibitory influence on pigment precipitation.

Apparently vitamin C exercises a regulatory function, an inhibiting influence in pigment production. This would explain the hyperpigmentation that occurs in scurvy and Addison's disease. In both conditions the administration of vitamin C is said to bring about some decrease in pigmentation. Chloasma uterinum has been said to have been favorably influenced by the administration of vitamin C.

Pigment, once formed, apparently acts as an anchor for vitamin C, perhaps for the purpose of using the skin as a storage depot. This is a paradox, for one would assume from the foregoing that, in the process of pigment formation, vitamin C would have to be decreased in quantity or destroyed to allow the reaction to be completed.

VITAMIN D.—Vitamin D, in moderate to large to excessive doses, has been used in a few dermatoses. It has long been known that exposures to ultraviolet light are of

benefit to some cases of acne vulgaris. This may be due to the activation of ergosterol in the skin by the ultraviolet rays. With this in mind, Doktorsky and Platt, two students with the disease, gave themselves 10 to 20 drops daily of viosterol. After continuing for one month, they noticed a decrease in the number of pustules, by actual count, of 75 to 80 per cent. They then gave viosterol to a group of thirty acne patients for four to five weeks, with 75 to 80 per cent improvement in 90 per cent of the subjects. When treatment was discontinued in ten of these subjects, an increase in the number of pustules was noted.

Hinrichsen and Ivy, stimulated by Doktorsky's observations, carried out an extensive investigation of vitamin D therapy in 178 cases of acne vulgaris over a long period of time. The lesions were counted and the patients graded according to Bloch's method. The dose of vitamin varied from 20,000 to 30,000 U.S.P. units daily (low dosage) 100,000 units daily (high dosage).

The high dosage was given when low dosage failed, or in exceptionally severe cases. No other form of treatment was given, with the exception of liver extract (for anemia) in a few cases. The patients were for the most part of adolescent age. They were given the treatment for several months, and follow-ups were made in some cases five months after cessation of treatment, to pick up recurrences.

Hinrichsen and Ivy found that 22 per cent showed marked improvement, 38 per cent moderate, 26 per cent slight, and 13 per cent no improvement. In other words, 60 per cent showed a definite response to treatment. Subjective ideas of treatment results were eliminated by an actual counting of all lesions. The question of spontaneous partial remission was considered, but it was thought that the number of patients showing improvement, and its degree, was far greater than could be accounted for by spontaneous remission. There were no control subjects.

In this study there was no change produced in the occurrence or number of comedones or seborrhea. Only the papulopustular elements of acne were influenced. Vitamin D, therefore, in adequate doses, may have some part in the prevention of skin infection. Noteworthy is the fact that one of Hinrichsen's patients, with an acneform eruption due to bromides, was relieved by taking 100,000 units of viosterol every third day.

Maynard reported satisfactory results in 75 per cent of 132 patients with acne vulgaris, treated with viosterol (24 drops daily) and local applications, excluding roentgen or ultraviolet rays. In a control group of acne patients treated with roentgen rays, etc., without viosterol (in preceding years), he obtained 63 per cent satisfactory results.

Maynard's experience with vitamin D in other skin diseases is interesting. He reported in the same article healing of two cases of localized scleroderma, three cases of alopecia areata, and three out of four cases of granuloma annulare. Incidentally, spontaneous involution is the rule in alopecia areata,

occurs occasionally in localized scleroderma, but is unusual in granuloma annulare. He reported 100 per cent improvement in a case of old roentgen atrophy, a feat which I believe is without parallel.

In earlier years the dosage of irradiated ergosterol was strongly limited by the appearance of toxic symptoms. However, these symptoms were found to be due to the toxic substances, whose presence was soon eliminated from the manufactured product. At the time the massive doses of viosterol became popular, Ceder and Zon were giving it to an arthritic with psoriasis. They were surprised to find complete involution of the psoriasis. In 1936 they treated fifteen cases of chronic, widespread, psoriasis with 300,000 to 400,000 units of vitamin D (irradiated ergosterol) daily. Eleven showed complete involution of psoriasis in twelve weeks, two obtained partial benefit, and two no benefit.

The cases had previously shown no tendency to spontaneous involution. No local nor dietary treatment was employed during the vitamin D administration. In addition, the subjects were protected from natural sunlight as much as possible. Three patients developed signs of hypervitaminosis D (nausea, malaise, urinary frequency) and all showed a mild hypercalcemia. Of ten patients who had received marked benefit, six had a recurrence within six weeks to five months after discontinuing treatment. Ceder suggested that it might be possible that a difference existed in the "antipsoriatic element" in different manufactured preparations. One of my colleagues gave crystalline vitamin D in massive doses to a group of psoriatics with very little benefit.

My own experience with vitamin D in psoriasis is limited to one case, a young, intelligent matron with psoriasis of fifteen years duration. Her lesions were small papules, well distributed over the cutaneous surface, a type of psoriasis which I believe to be resistant to treatment of any kind. After no improvement from ultraviolet light, salves and autohemotherapy, I placed her on an irradiated ergosterol product, 200,000 units of D daily. No improvement resulted after one month's treatment, so further treatment was discontinued.

What is the explanation for the beneficial effect of vitamin D in psoriasis as reported by Ceder and Zon? They stated that their patients had been resistant to treatment with "numerous local remedies." It is well known that psoriatics frequently improve under ultraviolet therapy and it is quite likely that their improvement is directly concerned with the synthesis of vitamin D in the skin by the ultraviolet light. Thus one would think that psoriatics who fail to respond to ultraviolet light would also fail to benefit from vitamin D therapy.

Brunsting attempted to corroborate Ceder's clinical findings. He gave 300,000 units of vitamin D daily in the form of ertron (activated ergosterol) to nineteen patients who, with three exceptions, had an apparently resistant form of psoriasis. Treatment was carried out in the fall and winter

months, a time when spontaneous remissions are infrequent. Three patients were entirely cleared, seven markedly improved, five slightly improved, and two became slightly worse. The treatment, which was continued over a period of months, was well tolerated. Interestingly enough, the arthritis of two patients was unaffected by the high vitamin therapy, as were also nails unaffected.

The results of vitamin D therapy in pemphigus are of great interest to all who have had experience with the disease. Ludy and Devalin reported good results in six cases. Tauber and Clarke report use of massive doses of D (100,000 to 500,000 units) in nine cases of pemphigus. In eight of these cases, partial or total disappearance of the cutaneous lesions was noted. Examination of the blood, during treatment, did not show any change in the calcium-phosphorus content or their ratio. Necropsy on three of the cases reported did not show any calcium deposits in the organs examined microscopically. Tauber found that the cutaneous lesions tended to appear again in all their severity if the medication was discontinued.

In spite of the fact that pemphigus has some tendency to spontaneous remission, I feel that the addition of massive doses of vitamin D will be found to be of great value in controlling the symptoms of the disease. That it will have any effect on the ultimate outcome (100 per cent mortality) is unlikely.

Summary.—While the use of vitamins in specific avitaminoses is almost invariably accompanied by brilliant results, the same cannot be said for their use as non-specific agents or as therapeutic adjuvants. In the absence of undernutrition, abnormal dietary, or clinical avitaminoses, the use of product containing all of the accessory food factors would seem unwarranted, unless one is striving for tonic effects. Also, at the present date, the use of massive doses of vitamins does not threaten to succeed the more conventional methods of treatment. Nevertheless, the field of vitamin research is far from being completely studied, and further efforts in this regard may be richly rewarded. —*North west Medicine.*

Reinfection in Congenital Syphilis.—Richard D. Hahn. *Am. J. Syph., Gonorr. & Ven. Dis.*, St. Louis, 25: 200—214. Mar. 1941.

The literature on second infection in congenital syphilis is reviewed. Up to the present time no indisputable second infection in a congenital syphilitic patient has been reported. In the earlier case reports the diagnosis of both the congenital and acquired infections had to be inferred from clinical appearances alone. More recent authors usually conformed to adequate criteria for the demonstration of the acquired infection but they accepted rather ill-defined dystrophies or purely anamnestic data as sufficient evidence for the previous presence of congenital syphilis.

The presumed significance of many of the so-called dystrophies is derived from the

older clinicians and includes (especially in the French literature) practically all the ills to which human flesh is heir. Presumed reinfections in which the presence of more or less vague dystrophies is the sole evidence of congenital syphilis cannot be accepted. The first infection must be proved to be congenital.

Second infection is very rare in acquired syphilitics who have reached the latent stage before the institution of treatment. It is altogether unlikely that second infection should occur in previously untreated tardive congenital syphilitics. Yet it is this type of case which has comprised the bulk of those reported in the literature.

The first early congenital syphilitic patients adequately treated by modern standards, are now reaching an age at which the incidence of acquired syphilis is high. It is with the hope of stimulating a search for more such patients that the author reports the present cases.

The author found 104 cases of probable or possible reinfection listed in the diagnosis file of the syphilis clinic of the Johns Hopkins Hospital. Among these, only three represented reinfections in possible congenitally syphilitic patients. One of these first came under observation at the age of 8 years. This case is not included in this report due to the obvious impossibility of entirely ruling out syphilis acquired early in life. The other two are reported in detail.

These two cases conformed to rigid criteria for both the congenital and the acquired infection. In the first there were 13 years of clinical and serologic negativity, including a negative cerebrospinal fluid, between the congenital and the acquired infection. In the second, although the serologic test for syphilis at no time became entirely negative, there were at least 8 years of clinical negativity (including a negative cerebrospinal fluid) between the congenital and the acquired infection.—*T. D. I.*

Proceedings of Associations

The Kistna District Medical Association, Masulipatam.

—The monthly meeting of the above association was held on 20-9-41 at the Govt. Hospital, Bezawada: with Dr. Captain N. B. Morris, L.M. & S., F.R.F.P.S., etc., Civil Asst. Surgeon, Bezawada, in the chair, and with 18 doctors present, including two lady doctors. After adopting the minutes of the last meeting presented by the Secretary, Dr. K. V. Subba Rao, L.M. & S., the Medical Meeting began at 5 p.m. There was an interesting discussion on topics of medical importance in which Drs. P. Seshagiri Rao, L.M.P., C. B. Ethirajulu, M.B.B.S., N. Rama Rao, L.M.P., and K. V. Subba Rao, L.M. & S., took part.

Raichur District Medical Association.

—The Annual meeting of the above Association was held on 3-10-41 at which the Annual Report of the Secretary for the year 1350 (i. e. 1940—41 A. D.) was read and adopted. It was resolved to reduce the monthly subscription so as to induce more members of the profession to join.

Dr. L. D. Khatri and Dr. L. Shrinivasa Rao, were elected the President, and Secretary and Treasurer respectively for the next year. It was also resolved that the Petrol Rationing Officer, Raichur, be requested to supply the Practitioners with coupons to the maximum amount possible under the supplementary rationing.

Guntur Branch of the Indian Medical Association.—The Annual Meeting of the Association was held on 11-10-41 at 4-30 p.m. in the premises of the Govt. Head Quarters Hospital, Guntur, and the following office-bearers and representatives for the next year were elected.

OFFICE BEARERS:

Shri. K. S. Subrahmanyam, *President*.
Dr. P. Veeriah Choudary, *Vice President*.
Dr. G. V. Hanumantha Rao, *Secretary*.
Dr. Padmanabha Rao, *Joint Secretary*.

MANAGING COMMITTEE-MEMBERS:

(1) Shri. G. Ragavacharyulu, (2) Mrs. Wright, (3) Shri. S. Rama Rao, (4) Shri. C. Rangasamy Reddy, (5) Shri. T. Chithanandam, (6) Dr. Y. Hanumantha Rao.

REPRESENTATIVES:

(1) Dr. D. Raghava Rao, and (2) Dr. G. V. Hanumantha Rao, to the *Indian Medical Association*.

(1) Dr. P. Veeriah Choudary, (2) Dr. G. V. Hanumantha Rao, and (3) Dr. C. Ramakrishnan, to the *Provincial Branch, Andhra*.

Drs. Veeriah, Gurumurthy, Rangiah, *Vice Presidents for Andhra Provincial Association*.

Malabar District Medical Association.

—A deputation on behalf of the above Association, consisting of Dr. A. B. Das, Dr. N. Achutan, M.B.B.S., and Mr. V. Krishna Menon, met the Surgeon-General when he visited Calicut, on 10-10-41, and discussed with him the resolution of the Association viz. that the pay of L.M.Ps. in Military Service should be raised; that the designation "D.M.S." should be allowed for all men who passed out as Hospital Assistants; that all L.M.Ps. should be called Asst. Surgeons; that the engaging of retired Government Medical men in emergencies ignoring the existing junior men in service is a gross injustice, that the age limit fixed for T.D.D. Course should be abolished, and that the system of appointing Hony. Physicians and Surgeons should be extended to the District also. The Surgeon-General expressed his sympathy with the first resolution and his agreement with some of the others and explained the difficulties in granting others. The deputation lasted for 45 minutes and withdrew with thanks.

The Indian Chemical Manufacturers' Association.—Presiding over the Third Annual General Meeting, held at Bombay

on 19.9.41, Raja Mitra B.D. Amin, in the course of his address pointed out the efforts of the importing interests in the country in trying to impede the establishment of reputation of Indian products by advertising them as substitutes for foreign products, and deprecated the tendency of the public and the medical profession to give preference to foreign products. He urged the manufacturers to remove the impression of inferiority about the Indian products by joint propaganda, demonstration and by raising the standard of products where necessary.

He also regretted very much the absence of any periodical reports about the manufacturing and importing activities of the Medical Stores Depots, and strongly urged the Government to invite the Indian Medical Manufacturers' Association to form a panel of representatives who might be kept in touch with the working of the Depots and thus avoid the deep-rooted suspicion about the activities of the Depots from the public mind. In conclusion, he urged the Provincial Governments, especially those of Bombay, Sind and Madras, to establish uniformity in the rules and regulations governing Excise by implementing all the resolutions of the Excise Conference of 1937.

All India Medical Licentiate's Association and the Bombay Medical Association.—Under the auspices of the above Association, a protest meeting of the Bombay Medical Profession was held on 20.9.41 and

passed resolutions to the effect that a uniform standard of medical education throughout India and common medical register be established by the Indian Medical Council, that the Medical Licentiate be also represented in the Council, that the Council be made wholly independent of the General Medical Council of the United Kingdom etc.,

Broach District Branch of the Indian Red Cross Society.—The Broach District Junior Red Cross Centre, organised a Food and Vitamins, Water & House-fly Exhibition from 7th to 9th September 1941. The Bombay Presidency Baby and Health Week Association and the Ahmedabad Sanitary Association also sent models, charts, films etc. with their workers for the purpose. The exhibition was arranged in the 7 D. Vakil Sanitary Museum Hall, Broach. It was kept open from 8 to 12 a.m. and 2 to 7 p.m. On all these three days, students and general public visited the exhibition in large numbers, and a special feature was that a large number of purdah women also attended, for whose sake the exhibition was kept open from 7 a.m. to 10 p.m. During the three days various films of Food and Health were shown and very much appreciated by the public with great enthusiasm. The Association wish to thank the Ahmedabad Sanitary Association, the Bombay Presidency Baby and Health Week Association, The Imperial Dairy, Bangalore, and others for their valuable co-operation.

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Government Notification

G. O. No. 3354/4.8.41.

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Additional Concessions to Rural Medical Practitioners

The rules published with the late Local Self-Government Department Notification Nos. 934 and 935, dated 18.8.36 at pages 451 to 454 of Part I-A of Fort St. George Gazette dated 1.8.36, are respectively amended as follows:—

I

In rule 1 of the said rules, (i.e. No. 934 dated 18.8.36) after the proviso to clause (b) the following further proviso shall be inserted, namely:—

"Provided further that when rural medical practitioners are selected for appointment in permanent vacancies preference shall be given to those who served in connection with the present war in or out of India."

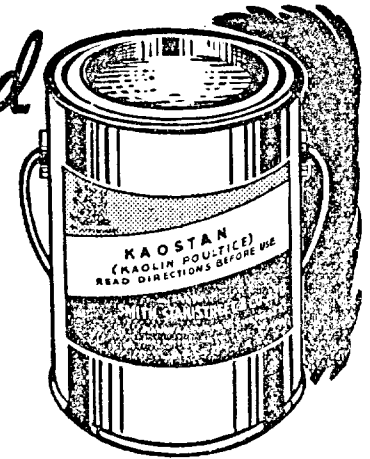
II

In rule 1 of the said rules, (i.e. No. 935 dated 18.8.36) after the proviso to clause (b) the following further proviso shall be inserted, namely:

"Provided further that when rural medical practitioners are selected for appointment in permanent vacancies preference shall be given to those who served in connection with the present war in or out of India."

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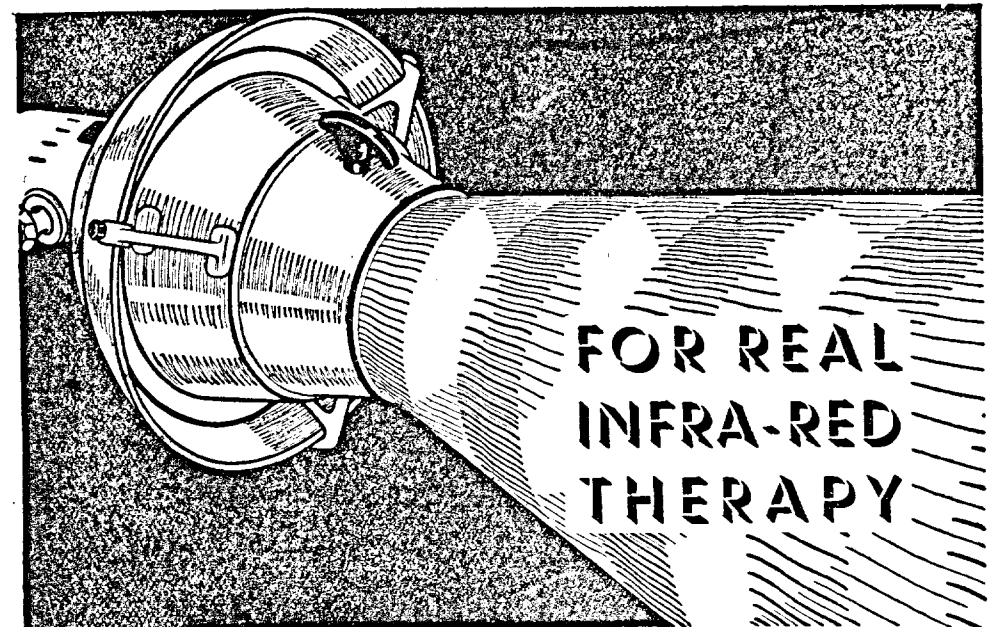
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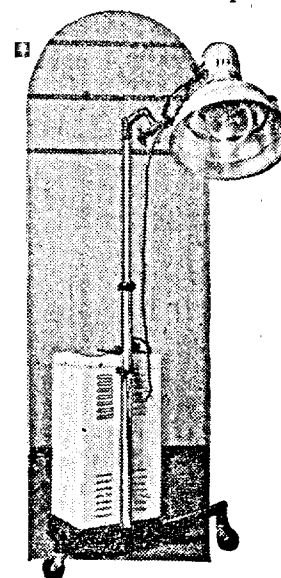
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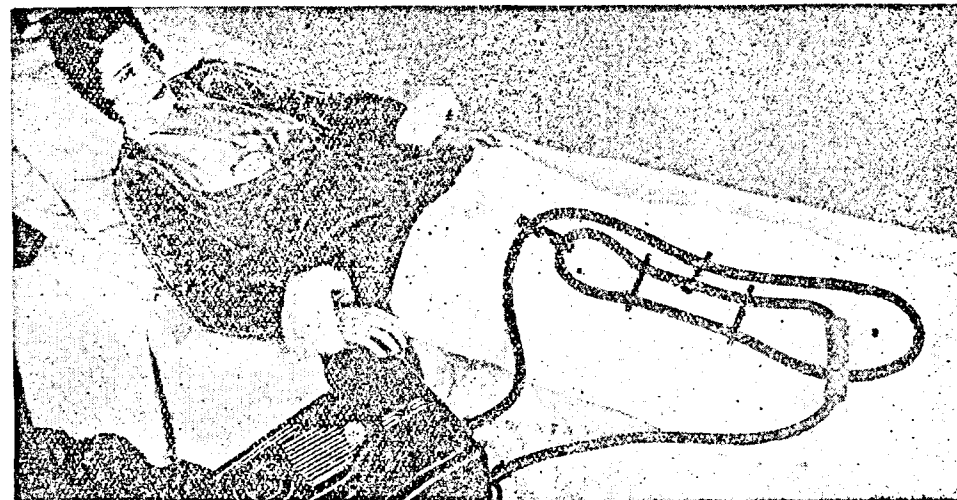
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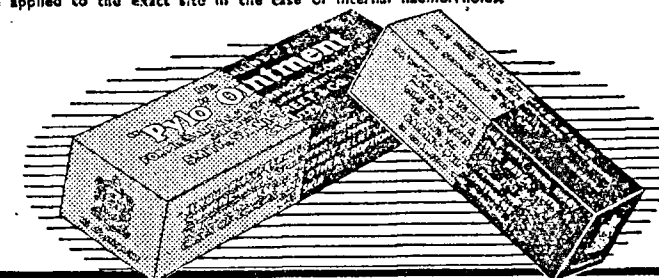
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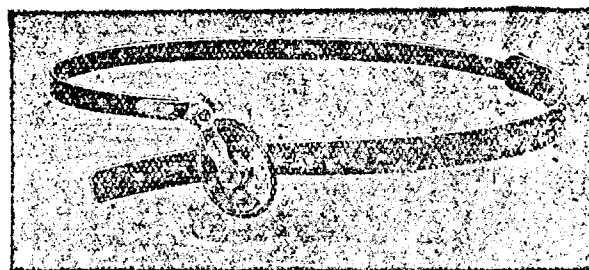
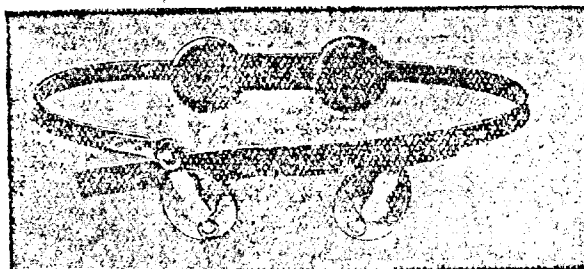
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