are traversed by the linear striæ mentioned above, which pass out in all directions from apex to base. Numerous small opacities about the size of a pin's head are seen scattered about the lung fields, caused by blood-vessels seen end on. In addition, denser shadows may be present of the size of a pea or larger. These are caused by a deposit of calcium in a primary healed tuberculous focus. The commonest site is in the tracheo-bronchial glands at the lung roots, but they may also be present in the lung parenchyma, where they form a "Ghon's focus." As the linear striæ pass out they curve in all directions, and the larger ones form curved outlines, which must not be mistaken for a cavity. It is not possible in a short paper to describe all the variations caused in the lung fields by disease, but the mottling of tuberculous disease should be looked for, especially at the apices, and below the clavicles. Early disease may be seen as scattered fine opacities in one of these situations, caused by tubercles in the lung, or as a single area of clouding about the size of a florin, possibly with a clear area in the centre, due to cavity formation. The larger cavities are shown either as irregular areas of lessened density, or as circular air spaces with definite walls. Pulmonary tuberculosis frequently has a definite distribution in the radiogram, which assists the differential diagnosis. It is seen to be located in one or both upper zones and to be spreading down towards the middle or lower zones. Cavities are commonest in this disease, but are present sometimes in other conditions, e.g., in new growth or lung abscess. The typical mottling of tuberculosis has to be distinguished from the coarser mottling of pneumoconiosis and carcinomatosis. In both these diseases the mottling tends to be present in the upper, middle and lower zones.

X-RAY DIAGNOSIS.

Whilst the history, pathology and clinical condition of the patient is essential for making an accurate diagnosis, it is a good plan to make an independent X-ray diagnosis on the film appearance alone. This will either corroborate or correct the original clinical diagnosis and will be of value in ensuring its accuracy.

SOME EMERGENCIES IN MEDICAL PRACTICE.

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STATES of emergency frequently arise in the course of medical practice. The subject is a large one, too large to be covered in any brief article, but I propose to discuss some of those emergencies that arise in the course of, and are due to, cardio-vascular disease.

Any definition of emergency seems hopeless since that which constitutes an emergency on one occasion may, under more favourable conditions, probably not be regarded as such. However, I would venture the following working definition. An emergency in medical practice is a state of unexpected urgency necessitating immediate non-operative treatment, with a view to the alleviation of the patient or the cure of his condition.

It will probably be more correct if we regard as true states of emergency those that

confront the physician on seeing his patient for the first time when in such a state, while those states of emergency which may occur during the course of any illness should be in some measure expected, and therefore preparation will probably have been made to deal with any situation that might arise. Although urgent treatment is required, still the presence of available remedies, as in hospital practice, materially lessens the urgency in such cases when comparison is made with a similar state confronting the physician in the private practice. Oxygen for example, as an immediate remedy, is seldom available save in institutions and in well-equipped municipal ambulances, and could hardly be included as an emergency remedy under such a definition as that with which I have endeavoured to limit the scope of this article.

It will therefore be appreciated that the first and most important factor is the necessity for an accurate diagnosis. This may be extremely difficult for many reasons. First of all, there may be the impossibility or inadvisability of making a thorough examination of the patient owing to inadequate assistance and unsuitable surroundings. Secondly, there may be complete absence of any history; this is not infrequently encountered, especially in cases where the patient is unconscious. It may here be remarked that there is a great deal to be said for a brief medical history being worn on the person of those patients who may from time to time be prone to succumb to urgent complications in the course of their disease process. Thirdly, the lack of facilities of various aids to diagnosis, such as will be found in any well-equipped hospital, may again render accurate diagnosis more difficult. It must, however, be stated that clinical evidence alone should, in the vast majority of cases, suffice to establish our diagnosis prior to the administration of the appropriate remedy. In discussing some of the states of urgency that may arise from cardio-vascular changes, I propose to paragraph them under the leading symptoms and sign present at the time, and thence to outline the salient features from which to make the necessary differential diagnosis, and finally to mention the more efficacious immediate remedial measures.

Pain of an urgent nature when occurring in the thoracic area is usually a true angina or is due to coronary thrombosis. The pain is terribly acute in both, but differential diagnosis should readily be made from the brevity of the attack, a good pulse tension, and frequent radiation of pain in the former, from the long-drawn-out agony of the latter, whose victim is restless, dyspnoëic, and moves about in great distress, at the same time showing signs of shock with a thin, low-tension pulse. The sphygmomanometer, if available, will confirm the difference in arterial pressure. The blood-pressure in the case of angina tends to remain high, while that in coronary thrombosis is usually low and tends to drop still further. Differential diagnosis is important, as the inhalation of amyl nitrite, $\text{m} 5$ in a capsule, is a specific remedy in an anginal attack, while it is of no avail in coronary thrombosis, and indeed may be harmful. Morphia, a $\frac{1}{4}$ gr. to $\frac{1}{2}$ gr. hypodermically, is usually efficacious in both, and the one immediate remedy of choice in coronary thrombosis, where anything less potent is valueless. Not infrequently fuller doses of morphia have to be given before the desired repose is attained. Occasionally cases of severe thoracic pain are met with in the neurotic subject, especially if there is an underlying dyspepsia. The symptoms are indefinite and occur usually in patients of younger age than those liable to angina or coronary thrombosis. In this connection it is usually stated that women are more prone to these anginal-like symptoms, but times of stress have certainly revealed an

increasing number of such cases among men, particularly among those whose work is of a sedentary nature. Some attacks of acute indigestion have quite definitely a similarity to angina, except that there is usually some restlessness, and while in these cases a tumbler of hot water with a teaspoonful of bicarbonate of soda will be all that is necessary, yet the withholding of morphia may possibly cause unnecessary suffering, especially should one's original diagnosis not be upheld. Further, acute intra-abdominal lesions such as biliary colic or the perforation of a gastric ulcer may cause severe pain in relation to the sternum, each of which may have to be considered in making a differential diagnosis. Likewise acute pain from pulmonary infarction, spontaneous pneumothorax, and intrathoracic new growth and aneurysms must be remembered. Happily, for various reasons morphia is again excellent treatment for the relief of the patient, after which further detailed examinations can be made. Thrombo-angiitis obliterans causes an acute pain, usually in the lower limbs. The nature of the cramp-like pains occurring in older subjects, and almost invariably associated with other signs of arteriosclerotic changes, serve to distinguish this condition from that of the muscular cramps of the young. Rest and heat applied locally will usually bring rapid relief, but in the event of this being insufficient, morphia may be necessary.

We find therefore that to afford relief in all urgent symptoms of pain accompanying cardio-vascular disease, morphia is our sheet anchor, and nothing is quicker save the action of amyl nitrite inhalation in angina.

Dyspnœa of a sudden onset is usually significant of an acute cardiac failure, and is due to stimulation of the respiratory centre from an insufficient supply of oxygen resulting from a slowing down of the circulation. Allergic asthmas are usually slower in onset, but it must be confessed that cases are encountered from time to time that may produce a most sudden onset. Other possible causes of dyspnœa, such as those due to the inhalation of irritating fumes, pulmonary embolism, or spontaneous pneumothorax, must be excluded by the history and examination, and by the fact that pain, which is a definite feature of the two latter, usually precedes any urgent dyspnœa. Further, dyspnœa is frequently present in the earlier stages of coronary thrombosis, and in fact may be the most marked symptom in such a case, but this disease, being accompanied by the other clinical phenomena, should be readily diagnosed. Probably the most dramatic dyspnœa is that of cardiac asthma in certain cases, when the patient, usually at night, wakes up terrified and gasping for breath. The characteristic high tension pulse is usually present, and the lungs at first are comparatively clear except for a few scattered crepitations. Morphia, $\frac{1}{4}$ gr. hypodermically, will bring rapid relief and rest. If unrelieved, however, this condition may pass into that of acute pulmonary œdema with cough and frothy blood-stained sputum, at which time loud bubbling crepitations can be heard all over the lungs. The pulse fails rapidly, and the blood-pressure may fall, with general signs of increasing left ventricular dilatation. In these cases likewise morphia, $\frac{1}{4}$ gr., will probably suffice, but must be accompanied by atropine, $\frac{1}{80}$ gr. to $\frac{1}{100}$ gr.

The removal of from half a pint to a pint of blood by venesection is extremely efficacious, and should be used in this and similar conditions with greater frequency. While this operation may be more neatly performed by the use of a large-bore venesection needle, in the experience of many the open method of incision of the median basilic vein in the forearm with the aid of a scalpel is preferable. Apart from the fact

that a venesection needle may not be at hand, a more rapid and ready flow of blood can be produced by the open method.

Finally, dyspnoea of a type, but less violent in onset, though steadily increasing in intensity, may occur in the earlier stages of paroxysmal tachycardias, whether due to fibrillation, flutter, or extra-systoles. The extremely rapid pulse-rate here, usually over 140 per minute, will assist in the differential diagnosis. The symptoms are chiefly those of discomfort, palpitation, and dyspnoea, and as a rule are less urgent, thus permitting of a more prolonged examination of the patient. Immediate treatment of these conditions should be attempted. Vagal stimulation may be tried by firm pressure of the vagus in the neck, and likewise by steady pressure on the eyeballs. While this is often successful in securing the cardiac rate and rhythm, it may be extremely uncomfortable for the patient unless skilfully applied, and preferably full doses of bromide and carminatives should be tried in the first instance, since many cases of simple paroxysmal tachycardia from ventricular extra-systoles are cleared up by this simple remedy. Undoubtedly in paroxysmal fibrillation and in flutter, quinidine in a 3 gr. dose at once is the ideal treatment, but the use of this drug is impractical, if not dangerous, away from the assistance of the electro-cardiograph.

Cyanosis as a marked feature accompanies those symptoms in cases in which there is any circulatory failure, either from right heart failure or mitral stenosis. Cyanosis alone indicates no need of urgent treatment, but when this sign is present together with other urgent symptoms, venesection will probably be indicated, especially when there is any venous engorgement.

Coma.—Cases of coma, when seen for the first time, are probably among the most difficult for the physician to diagnose accurately on clinical grounds alone, and without the numerous aids that the laboratory can afford.

Histories are frequently inaccurate or unobtainable. A rapid clinical examination may have to suffice to exclude such causes as diabetes, uræmia, epilepsy, injuries to the cranium, drugs such as alcohol, opium and barbitone compounds, coal and sewer gases, &c., from the comas found in cases due to cardio-vascular disease.

In cardio-vascular disease, coma is most commonly due to cerebral hæmorrhage. In deep comas of this nature, differential diagnosis may be difficult. The stertorous breathing, with possible evidence of greater flaccidity on the one side of the cheek and the limbs of one side of the body, together with an extensor plantar reflex, may indicate the correct diagnosis in those cases where coma is not too deep. Likewise, the presence of conjugate deviation of the eyes will be present in pontine hæmorrhage.

The pulse is usually full and bounding with a high and increasing pressure. The patient should be laid flat with the head slightly turned to one side, the jaw and tongue held forward to avoid asphyxiation. Immediate venesection should be performed, from half a pint to a pint of blood being removed. The introduction of a strong hypertonic solution of magnesium sulphate may be tried. The solution consists preferably of an ounce of magnesium sulphate in as little water as will dissolve it completely, and may be introduced into the stomach with the aid of a tube, or into the rectum. The latter site is preferable as the effect is the same, while in the event of any rejection taking place the latter situation is safer and avoids the possibilities of asphyxiation by aspiration.

Convulsions may occasionally be observed in the early stages of cerebral hæmorrhage. Other signs will be present, together with the full forcible cardiac action of the

hyperpnetic, and the appropriate treatment has already been indicated. In the Stokes-Adams syndrome a few brief convulsions may be observed, affecting usually only the head and upper limbs. The attack, together with cyanosis, is brief, a matter of a few seconds only, following on a short period of pallid unconsciousness, and the absence of palpable cardiac contractions will help to indicate the diagnosis. Other possible causes of convulsions that may at first lead to confusion in diagnosis are uræmia, G.P.I. and, rarely, acute alcoholism in the chronic alcoholic.

In a Stokes-Adams attack the patient either succumbs immediately or lives; the time is usually a matter of a few seconds, at the most a few minutes, and the latter result depends on the ventricle being able to take up its own rhythm of contractions. This it must do of itself in the great majority of cases that recover. Under the most favourable circumstances, 5 minims of adrenalin, if available, should be injected direct into the heart through the fourth intercostal space, half an inch to the left of the sternum, a more uniformly rational procedure than intravenous injection, as this may fail to be effective should the circulation have already ceased.

Syncope is a frequent complication of cardio-vascular disease, and when due to temporary and partial left ventricular failure calls for the administration of cardiac stimulants. Much has been written on this question of cardiac stimulants, and much has been claimed for the numerous proprietary preparations on the market. Each and all have their enthusiastic supporters. Strychnine, camphor and cardiazol are of doubtful value. Digitalin, even intravenously, is too slow. Strophanthin, $\frac{1}{150}$ to $\frac{1}{20}$ gr. intravenously, is probably the most useful, in that the full effect is usually obtained in well under half an hour. Adrenalin is likewise a powerful cardiac stimulant. It is of great value in failure during anæsthesia and collapse from peripheral failure with cyanosis, low blood-pressure, and feeble, rapid-running pulse, as is seen in toxæmic shock.

Hæmorrhages, sufficient to cause a state of emergency, may arise from the nose in hyperpiesia, from the lungs in aneurysm and mitral stenosis, and blood may be vomited, usually in those cases where bleeding has occurred in the nose and the blood has subsequently been swallowed. Epistaxis in hyperpiesia, unless extremely severe, will do little harm, but occasionally local packing with adrenalin gauze may be necessary. In hæmoptysis from a weeping aneurysm, morphia is advisable, while the pulmonary congestion of mitral stenosis can be relieved best by venesection and morphia.

In conclusion, it will be necessarily appreciated that emergencies arising from cardiac causes are frequently fatal in termination, within maybe a few moments of apparent good health; in such cases we are quite helpless, but, on the other hand, by a prompt recognition of the condition and rapid administration of the appropriate treatment, many cases may be saved to enjoy an indefinite, though probably a necessarily quiet, life.

The remedies at our disposal mainly consist of morphia, adrenalin, strophanthin, atropine, amyl nitrite and venesection. Their uses I have indicated, and their therapeutic actions are well known. Finally, morphia in doses of at least $\frac{1}{4}$ gr. will usually be found to be more effective than any of its allies.