The case may be classed as one of nodal bradycardia, being one of those uncommon ones in which the pulse beat is regular. If we assume that the wave a' is due to auricular contraction, and in the light of that interpretation we look for an explanation of the tracings taken on December 5th, 10th, and 16th, we see that a wave due to auricular systole, whether resulting from an impulse normally produced at the region of the sinus or in the nature of a bigeminy due to auricular extrasystole, appears in a position intermediate between those due to the ventricular contractions. But because conduction is impaired, it fails to produce a ventricular contraction.

The failure of the ventricle to contract can be explained as due partly to the refractory state of the ventricle from its previous contraction, the period between the end of the ventricular systole which has occurred and the beginning of the next a' wave being $1\frac{1}{2}$ fifths only. The ventricle is, however, at the time of the arrival of the impulse from the auricle in a state of diastole, and should therefore be in a condition capable of contraction. The fact that it does not occur, therefore, shows some degree of impairment of conduction or excitability of the musculature. The difficulty arises that a' is not followed by a wave due to ventricular systole on account of block, but the ventricular systole is able to produce an auricular contraction by retrograde stimulation.

At the same time it is difficult to conceive that the ventricular systole should always bear the same time relationship to auricular systole that it does, over so long a time, unless there is some direct connexion between them. What the connexion is, unless it is retrograde stimulation from ventricle to auricle, it is difficult to say. If there were such pathological changes in the junctional tissues that no stimulus could pass from auricle to ventricle, there would be complete dissociation of auricular and ventricular rhythms, and they would not bear a constant time relation to one another.

Although, however, the power of conduction is so far reduced by organic changes, or by nerve influence, as to prevent a' being followed by ventricular systole, on account of the proximity of the previous ventricular contraction, by the time the next ventricular systole occurs it may have sufficiently recovered to permit a retrograde stimulus to cause an auricular systole.

However this may be, this contraction of the auricle, not having been responded to, a spontaneous contraction of the ventricle takes place before a normally produced auricular contraction is due. As a result the wave due to the ventricular occurs before that due to the auricular contraction.

During the period following the previous ventricular contraction stimulus material has been formed in it, and the ventricular muscle has been recovering from its refractive state, the two conditions approaching a state suitable for producing a homogenetic idio-ventricular contraction. The time taken for the process to be completed normally in the ventricle is at least $7\frac{1}{2}$ fifths of a second. In the present case the period between the end of the ventricular contraction and the beginning of the next is about $5\frac{1}{2}$ fifths. The explanation of the fact that the sinus rhythm controls the ventricular in the normal mechanism is that the formation of stimulus material at the sinus takes place at a greater rate in it than it does elsewhere in the heart. If for any reason the idio-ventricular rhythm is not dormant, and the periods of time between the formation of stimuli in it are shorter than in the sinus, the ventricular rhythm will predominate.

In the present case the idio-ventricular rhythm is not dormant, and the rate of stimulus formation in the ventricle being more rapid than is usual, combined with the fact that no effective stimulus has reached the ventricle for so long a time, the ventricle escapes every cardiac cycle, as seen on the tracings of December 5th, 10th, and 16th.

This ventricular systole due to the escape of the ventricle causes a retrograde stimulation of the auricle to contract. The conclusion is irresistible that it is not mere chance or coincidence that the ventricular contraction should take place at about the time of the normally-produced stimulus of the auricle with such great regularity.

For this reason I conclude that a retrograde stimulation of the auricle has occurred. In this way the regularity of the rhythm is maintained and the condition is produced of the ventricular contraction, which is effective in maintaining the circulation, arising in an abnormal situation.

Tracings taken on several occasions subsequently have shown a perfectly regular pulse, though somewhat infrequent, and in all other respects normal both in regard to the venous and radial curves.

It follows, therefore, that if the degree of heart-block which resulted in the second of the bigeminal auricular contractions not being followed by a ventricular response was due to organic lesions in the tissues of the heart responsible for the conduction of impulses, those lesions have been removed.

Cases of heart-block have been recorded in which the block has been due to a haemorrhage from traumatism or spontaneous rupture of an atheromatous artery in the neighbourhood of the auriculo-ventricular bundle. It is conceivable that such a lesion could clear up sufficiently to allow the subsequent passage of impulses. The case discussed may have been due to haemorrhage in the bundle caused by such a condition. But this is unlikely in the absence of any history of injury, and in consideration of the patient's age and the absence of evidence of atheromatous arteries elsewhere.

The conclusions arrived at from a study of the polygraphic tracings are that the infrequency of the pulse-rate is due primarily to a relative delay in the rate of stimulus formation at the sinus. This, together with an extrasystolic contraction of the auricle not followed by a ventricular response, causes the period before effective stimulation of the ventricle coming from the normal situation to be so long that the ventricle escapes, and in turn produces auricular contraction by a retrograde stimulation, thus producing the establishment of the idio-ventricular rhythm.

FATAL PURPURA FOLLOWING SCARLET FEVER.

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RELATIVELY rarer than the mild purpura chiefly affecting the lower extremities which occurs after scarlet fever is a malignant form with extensive superficial lesions in various parts of the body. The case here reported belongs to the latter type, but is unique in the writers' experience in that the purpuric areas showed a definite inflammatory element. The inflammation was revealed not only by an undue degree of tenderness, but by marked swelling of the loose tissues, and a certain amount of induration. Early in the attack it seemed likely that the lesions would become gangrenous, but the patient died before any breaking down had occurred; also it was noticed before death that at points on the right leg and left arm the purpura was beginning to retrogress.

The patient was a boy aged 6 years, who was admitted to Plaistow Hospital with scarlet fever. There was a history of measles, chicken-pox, and whooping-cough within the two previous years; as a result, it was stated that he became anaemic, but that otherwise his health was good. There was nothing noteworthy in his family history.

At the time of admission the attack of scarlet fever was declining. The case ran the usual course, without complications, and by the end of the fifth week the patient was up, and seemed in ordinary health save for the persisting anaemia. Iron and cod-liver oil were prescribed. In the seventh week moderate tonsillitis set in. The boy's temperature rose to 100° F. He was kept in bed, and in two days the pyrexia disappeared. The tonsillitis, streptococcal in origin, also rapidly subsided. The patient, however, was not allowed up as the anaemia had slightly

increased. His blood was examined and showed merely a fall in the red cells with slight hyperleucocytosis. No enlargement of the lymphatic glands could be found, and the spleen was not palpable.

At the beginning of the eighth week, when he was about to be allowed up, a purpuric patch, 4 in. square, suddenly appeared on the outer side of the right ankle. It was dark purple, painless, but rather tender. There was no evidence of trauma. In the evening the temperature rose to 100° F., and by the following day the patch was slightly larger. Towards night similar areas developed on the extensor surfaces of both elbows. The boy moved his arms easily although not willingly. During this night and throughout the following day the blotches on the arms spread rapidly, and a fresh one was found over the inner malleolus of the left foot. The boy now became restless, but did not complain of pain except when the affected parts were touched. He refused to move himself, but often asked the nurse to change his position.

On the morning following the next day the left ear was affected. It was deep purple in colour, and very swollen and tense. From the ear the lesion extended within twenty-four hours over the whole of the left side of the face, scalp, and neck. This, the largest area, was sharply margined. During the same period a patch was noticed on the outer side of the left thigh, and in twelve hours had a diameter of 6 in.

On the morning of death the following was the patient's condition: He was markedly anaemic but mentally clear. There was great disfigurement of the face, more particularly in the region of the orbit and mouth, the lesion being here still unilateral. Small black blebs had formed on the ear, the face, and one extremity. The contained fluid proved sterile under ordinary cultural tests. In continuity with the lips the left buccal surface was discoloured. An area about three inches in diameter was present on the extensor surface of the right elbow. Another covered the whole posterior surface of the right hand. The palm of the hand was unaffected except for a purple tingeing of the flexor lines. A fading greenish patch occupied the back of the left elbow. Another was present on the dorsal surface of the hand and first two fingers. An area on the outer side of the right ankle presented the greenish and yellowish tints of a fading bruise. This was the earliest lesion. There was a purpuric spot near the nail of the great toe. A large circular patch, 6 in. in diameter and with a very definite margin, covered the middle of the thigh on its outer side. Over the front and inside of the left foot there was an irregular reddish-purple patch with a few dark vesicles on it; a similar patch was over the patella. The skin on the trunk and abdomen was unaffected.

During the three days before death the temperature varied irregularly between 100° and 103° F., and the pulse steadily weakened. A blood count taken on the day of death gave 3,600,000 red cells and 50,000 leucocytes. A differential count yielded the following percentages: Polymorphonuclears 88 per cent., small lymphocytes 4 per cent., large lymphocytes 6 per cent., eosinophiles 2 per cent. No nucleated red cells or myelocytes were found in the films. At no time during the illness was there haemorrhage from the mucous surfaces. Unfortunately an autopsy could not be obtained.

UNDER the will of the late Miss Hannah Elizabeth Gartside, of Holmfirth, Yorkshire, King Edward's Hospital Fund for London, the Brompton Hospital for Consumption, St. Thomas's Hospital, and Guy's Hospital each receives a sum of £1,000.

WE learn from the *Journal of the American Medical Association* that in a recent case the eighth circuit of the United States Circuit Court of Appeal affirmed the conviction of one Ackley who had sent a letter through the mails recommending a lady's syringe and sanitary powder for the purpose of preventing conception. The statute declares unlawful every article or thing . . . described in manner calculated to lead another to use it for preventing conception. The article might be of legitimate use and might not prevent conception, but would nevertheless be unlawful if calculated to lead another to use it for such purpose. British law is, we believe, silent on this subject.

ACUTE FACIAL DERMATITIS PRODUCED BY A HAIR DYE.

BY

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THE use of dyes for the hair is admittedly common, but there are so few records in medical literature of accidents resulting from their application that the publication of the following illustrative case may serve a useful purpose, both as a guide to diagnosis and possibly as drawing attention to the dangerous nature of the most commonly employed chemical substances in this connexion.

A married lady, aged 48, engaged in a profession in which public platform appearances play an occasional part, came for the treatment of an acute blotchy erythema limited to the face and scalp, and associated with very acute subjective sensations of burning and itching, severe enough to interfere with sleep and prevent completely the carrying on of her daily routine. These symptoms had been present for forty-eight hours, and had gradually increased in severity. There was considerable mental excitement. The severity of the inflammation had produced oedema of the eyelids, but no vesicles or papules were evident. Although she complained of attacks of shivering and felt thoroughly ill, the temperature and pulse were both normal and the tongue only slightly furred. There was a history of three such attacks (each lasting four to five days) in the preceding eighteen months; she had never previously had any skin trouble. Her scalp, however, had been irritable for two years, and the various lotions prescribed for this and for the acute attacks appear to have relieved without permanently curing the condition. She was quite convinced that every attack had had its origin in the scalp. An examination of this revealed only hyperaemia and a few scales, which on microscopic investigation with methylene blue proved to be sterile. The idea of a seborrhoeic basis for her complaint was therefore abandoned. The colour of the hair, a sort of matt gold, known to ladies as *blond cendré*, had not excited the suspicion of artificial tinting at first, but on the following day a cautious inquiry elicited the important admission that a "harmless" vegetable preparation had been in frequent use for the past three years. Two solutions were employed to obtain the desired tint—the first of an opaque dark brown colour, the other clear and smelling strongly of sulphuretted hydrogen. The former, on analysis, was proved to contain small quantities of a silver salt and traces of pyrogalllic acid as pyrogallate; the second was a weak solution of sodium sulphate.

It is not my present purpose to discuss the nature or *rationale* of the chemical staining powers of these substances or of their interaction; but it cannot be too strongly emphasized that pyrogalllic acid is an irritant to the skin of susceptible individuals. It may also produce a toxic nephritis by absorption, and its local caustic action in strong solution is often made use of for the destruction of nodules in ulcerating lupus. In weaker solutions it may initiate an irritation akin to that produced by chrysarobin, for which it was originally introduced as a substitute. The effects are most commonly seen on the hands of photographers, many of whom employ it or one of its derivatives (hydroquinone, metol, etc.) in the development of negatives. In these patients also the complaint usually is that they have been using the substance for years without any ill effects, and that they cannot understand why the dermatitis should have appeared only recently. The explanation of this fact is not clear, but may depend on the gradual production in the patient by repeated small doses of the noxious drug of the anaphylactic state, in which the very smallest quantities of it, if rubbed into a small area of the patient's skin, will produce in a few hours (twelve to twenty-four) a very marked reaction (Judassohn's test). Hair dyes may, for purposes of classification, be divided into those which produce their effects by simple staining—for example, walnut juice—and those which depend on a chemical action. To the latter and more dangerous class most of the advertised preparations belong, partly because the