rectum. The patient rapidly improved, was given liquid food by the mouth on the eighteenth day, and solid food on the twenty-eighth day. The abdominal wound healed by first intention, and on March 19th, that is, thirty days after the operation, the patient was walking about the ward, going into the garden, and eating ordinary food.

It was decided to send the patient into the country, and so she was kept in the hospital until a vacancy in a convalescent home occurred. Three days before the date on which it was arranged that she should leave the hospital, that is, on the evening of April 13th, the patient complained of some pain in the abdomen, and was sick. The pain continued on Saturday morning, and she was sick again. I saw the patient in the afternoon of Saturday, and found her complaining of a colicky pain in the abdomen. Her general condition was good. I ordered an enema to be given, and all food by the mouth to be stopped. Having arranged to leave London on that day for a short holiday, I asked the house-surgeon to call in one of my colleagues, if the patient's condition did not rapidly improve. No result followed the enema, so the house-surgeon ordered doses of mag. sulph. (3j) to be given every hour. Four of these doses were given, and on Sunday morning the patient was so much worse that Mr. Eve was asked to see the patient. Mr. Eve considered that she was suffering from intestinal obstruction, probably caused by a band, and proceeded to perform abdominal section. Ether was administered, and an incision was made through that part of the scar of the former incision that was below the umbilicus. The great omentum was found adherent to the wound, and at the lower part of the scar a band could be traced to a coil of intestine, and this band had caused a kink in the gut sufficient to produce complete obstruction. The band was attached to the gut about 6 inches above its entrance into the cæcum. The coils of intestine on the proximal side of the band were greatly distended and very congested. On the distal side of the band the intestine was collapsed. The band was removed, and immediately afterwards the collapsed coils became distended, showing that the obstruction had been relieved. The peritoneal cavity, which contained some blood-stained fluid, was washed out with warm boracic lotion, and the wound sewn up by silk-worm-gut stitches. The operation lasted 45 minutes.

The patient recovered to a slight extent from the shock of the operation, but never thoroughly rallied. She gradually became weaker, and died about thirty-six hours after the operation.

Post-mortem Examination.—On opening the abdomen a considerable amount of lymph was found upon the intestines, and the peritoneal cavity contained a quantity of turbid fluid. About 3 inches above the attachment of the band to the small intestine was a perforation from which the intestinal contents escaped. A little higher up was another perforation. On opening the intestine it was found that each perforation was in the centre of a small ulcer. The ulcers were evidently of very acute and recent formation, as the whole thickness of the intestinal wall at these spots was necrosed. There were several other necrotic patches within 18 inches of the obstructed point. For about half an inch from the pylorus the duodenum was thinner than normal, and the peritoneum over it was puckered. The duodenum was quite healthy, and presented no traces of past or recent ulceration.

REMARKS.—This case is of interest from two distinct points of view. First, the successful treatment of the duodenal ulcer; secondly, the unfortunate sequela of strangulation by a band. More especially is the case of interest from the first point of view, because, so far as I have been able to ascertain, no successful result of excision of a perforated duodenal ulcer has yet been recorded. Not long ago Mr. Lockwood read a paper before this Society on two cases of perforation of duodenal ulcers, and in each of which he failed to find the perforation. In his cases the perforation was on the posterior wall of the duodenum, and almost impossible to expose. In my case, on the other hand, the perforation was situated in the most convenient spot that could be desired—namely, on its anterior aspect, and the difficulties to be overcome in excising the ulcer and suturing the duodenum were but slight.

As regards the unfortunate result, it is impossible, so far as

I can see, to prevent the formation of a band after abdominal section for acute peritonitis, especially acute purulent peritonitis. In these purulent cases, at any rate, I do not think that stitching up the peritoneum by itself, before suture of the abdominal wall, could lessen in any way the tendency to the formation of adhesions between the inflamed, lymph-covered intestines and the abdominal wall.

One is rather inclined to conclude with this statement—that if after abdominal section an attack of acute abdominal pain and intestinal obstruction supervene, an exploratory operation should be performed as soon as possible, even if the general condition of the patient would, under ordinary circumstances, scarcely be considered grave enough for immediate surgical interference.

I wish to express my thanks and indebtedness to my colleague, Mr. Eve, for his kindness in taking charge of the patient during my absence.

HALLUCINATIONS IN THE SANE, ASSOCIATED WITH LOCAL ORGANIC DISEASE OF THE SENSORY ORGANS, ETC.

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THE following paper deals with cases which have come under observation during the last six years at the National Hospital for the Paralysed and Epileptic, and I am indebted to the physicians under whose care they were for permission to make use of the notes.

Inasmuch as there was a definite peripheral cause for the hallucinations, the more restricted term "illusion" might have been more accurate, but as this would lead to confusion in the cases where local ear disease led to hallucinations of vision as well as hearing, the more general term "hallucination" has been employed throughout, it being now pretty generally recognised that there is no essential difference in the nature of illusions and hallucinations.

Hallucinations due to drugs (alcohol, opium, haschish), to toxic substances circulating in the blood (as in fevers, etc.), those associated with thoracic or abdominal visceral disease, and those occurring as an aura in rare cases of idiopathic epilepsy are purposely omitted. Attention is confined to those cases in which there was demonstrable local disease of the eye, ear, etc., or of sensory regions of the brain.

It will be noticed that the hallucinations were mostly temporary, associated with some general bodily disturbance, and passed off with the return of the general health to normal. So, too, the whole brain seems to have been disturbed, and we find hallucinations excited of other senses than the one whose organs are affected.

HALLUCINATIONS DUE TO LOCAL DISEASES OF THE EYE.

These are far from infrequent. They are usually extremely definite, so that the patient can give an extremely vivid and detailed account of them. Unless he is much out of health, he rarely believes in their reality, in marked contrast to the condition in toxic cases (alcohol, etc.).

They occur frequently from opacities in the media, and occasionally in glaucoma seem to represent the flashes of light which are so often experienced in that disease. They are common in cases of optic atrophy, but I have not at present met with them associated with optic neuritis.

CASE I. Old Choroiditis, and Floating Bodies in Field of Vision: Fresh Inflammation of Eye: Temporary Hallucinations of Vision.—Miss C., aged 38 (under the care of Dr. Ferrier), had had choroiditis and floating bodies in the vitreous for some years. She had not been taking alcohol or narcotics. Coincidentally with some acute inflammation of the eyes, which depressed her very much, she developed hallucinations of vision. She complained that numerous beetles like ordinary cockroaches with red eyes kept swarming over the bed and on the ceiling. Two days later she complained in addition that "a woman in red, all on fire," kept coming to her bedside, and annoying her (one of the nurses in ordinary uniform). For a day or two she believed in the reality of these appearances, but as her general condition improved, she ceased to mind them. When they disappeared, the field again became full of ordinary muscæ volitantes.

CASE II. Syphilitic Retinitis: Numerous Floating Bodies in Field: Temporary Hallucinations of Vision.—W. E., aged 50. The retinitis noted above was of long standing, and had been quiescent for some years, but had recently become troublesome, and for some months he had had numerous

floating bodies in his field of vision. During the last few weeks these objects had taken the form of faces, including, he says, "everyone he has seen in his life." He never sees any part of the body beyond the face. He quite recognised that they were illusions, and they caused him no annoyance.

CASE III. *Illusion due to a Retinal Hemorrhage.*—Mrs. R., aged 50 (under the care of Dr. Hughlings Jackson) suffered from pernicious anemia. A few days before death she had a crop of retinal hemorrhages, one of which was near the yellow spot. During the next few days she complained of a blackbird which would remain perched on her bed, and refused to fly away.

Raggi¹ and Griesinger² each quote cases in which the development of hallucinations in persons otherwise sane was associated with the formation of a cataract.

HALLUCINATIONS DUE TO LOCAL AFFECTIONS OF THE EAR.

External Ear.—Mabille³ describes an interesting case of unilateral hallucinations of hearing which ceased when a grain of wheat covered with wax was removed from the external auditory meatus. Wigan⁴ in this connection relates an interesting personal experience: "I remember hearing in Italy a bell with a very peculiar sound at a time when I was in the midst of a long train of painful emotions. I never heard the sound again, but in passing Mount Cenis.....I felt that I had taken cold in my ears, which began to get somewhat painful, and suddenly I heard the peculiar sound of the bell of Mola di Gaeta. I was entirely convinced that I heard a bell, and looked round in vain for a campanella. All the way from there to Beauvoisin the same sound continued in my ears, renewing all the painful associations associated with my first hearing it." It did not disappear until he reached an hotel some hours later, and had his ears syringed with hot water. A case has been recorded by Max Buch⁵ in which there were severe hallucinations of hearing accompanied by otitis media, which ceased when the otitis was relieved.

Labyrinth.—Much more frequent are hallucinations associated with disease of the labyrinth. The local disease causes noises of an indefinite character—roaring, humming, buzzing, whizzing, etc. Not infrequently there is a sense of rotation round a vertical or transverse axis, "auditory vertigo"—that is, an illusion of the sense of equilibration. When a patient suffering in this way gets below par, the noises may take a more definite form such as voices, and not infrequently hallucinations of other senses are superadded.

CASE IV. *Auditory Vertigo: Hallucinations of Hearing and of Vision.*—Mrs. M., aged 61, had had deafness with absent bone conduction, constant noises in head, with occasional vertigo for eight years. Recently she had hallucinations (a) of hearing. Frequently at breakfast she heard a strange voice saying imperiously, "M., go to bed"; "M., you are dirty, go and wash," and so on; (b) of vision. She occasionally saw figures. Usually "an Indian woman appeared with a shawl thrown over her face," but sometimes she saw a bishop in full canonicals. She did not believe in the reality of these appearances, but was anxious lest they should lead to permanent mental trouble. They entirely disappeared after two months' treatment with bromide and quinine.

CASE V. *Auditory Vertigo: Visual and Olfactory Hallucinations only: Violet Vision during the Attacks.*—Mrs. C., aged 55 (under the care of Dr. Buzzard), had suffered from vertigo and deafness, with loss of bone conduction, for some years. The vertigo consists of a sense of rotation around a vertical axis. At the close of the attack she has hallucinations of vision, usually faces of a man, woman, or crying infant. The whole room and everything about her seem violet. Some time ago she had olfactory hallucinations, consisting of a smell of putrid fish, lasting five minutes. There have been constant noises in the ear but no definite hallucinations of hearing.

CASE VI. *Labyrinthine Deafness: Hallucinations of Hearing, etc.*—Mrs. F., aged 54 (under the care of Dr. Buzzard), suffering from labyrinthine deafness (Mr. Cumberbatch), and frequent noises in head. Some months ago, while in bad general health, she heard a peal of bells several times, and on another occasion she heard the roar of Niagara (near which she formerly lived) with such distinctness that she was hardly to be persuaded that she was not in her old home in Canada.

Dr. Ormerod⁶ records a case of well-marked auditory vertigo with increasing tinnitus. After some years the patient began to hear not only noises, but words, names of streets, songs, etc. She subsequently developed hallucinations of smell and vision, but remained perfectly sane.

In connection with the "violet vision" mentioned in Case v, a similar occurrence in a case of auditory vertigo published by Hughlings Jackson⁷ may be quoted: A surgeon who had formerly been completely deaf from the report of a gun, and had had frequent attacks of vertigo, was driving on a cold day when he felt pain above his right ear. Suddenly all objects became of a brilliant scarlet colour. This passed off abruptly after an hour or two, but the pain and vertigo persisted, with intermissions, for some days.

HALLUCINATIONS DUE TO LOCAL DISEASE OF THE BRAIN.

CASE VII. *Tumour involving Left Temporo-sphenoidal Lobe: Hallucinations of Hearing in Right Ear.*—W. P., aged 38, under the care of Dr. Buzzard, suffering from epileptiform fits, beginning in the right hand, and double optic neuritis. A few weeks before death he complained repeatedly of a noise of the ringing of bells in his right ear. Subsequently he complained that the musical box in the ward was allowed to play in the night—which was not the case—and for the last ten days of his life, when he had become very drowsy and dull in answering questions, he would lie on his back with a pleased smile on his face, keeping time with one hand to imaginary music. At the necropsy a sarcomatous tumour was found involving the lower end of the ascending frontal and parietal convolutions, extending across the fissure of Sylvius, and involving the superior temporo-sphenoidal convolution.

Tomaschewsky and Ssimonowitsch⁸ report a case in which there were unilateral hallucinations of hearing and vision, and in which *post mortem* the dura mater was found to be thickened and adherent to the superior temporo-sphenoidal convolution and to the angular gyrus, but not elsewhere.

More common are hallucinations of vision associated with hemianopia from lesions of the cuneus, or paths leading to it.

CASE VIII. *Left Hemianopia, with Hemianesthesia and Hemiplegia: Hallucinations in the Blind Field.*—Mrs. A., aged 45 (under the care of Dr. Ferrier), suffering from hemianopia, hemiplegia, and hemianesthesia, probably due to a lesion at the posterior part of the right internal capsule. For three weeks after the onset she saw numerous faces of men, women, and children. The faces were unfamiliar and were not unpleasant, and she quite recognised that they were unreal. They always appeared on her left side—that is, in the blind field. They entirely passed off, the hemianopia persisting.

An exactly similar case of transitory visual hallucinations in the blind field (dogs, children, etc.), associated with hemianopia, is recorded by Peterson⁹, and Henschen¹⁰ has reported four cases in which the localisation of the disease in the cerebral cortex was confirmed by a necropsy.

CASE IX. *Tumour Pressing on Middle Lobe and Peduncles of Cerebellum: Hallucinations of Sense of Position followed by Hallucinations of Vision, etc., derived from these.*—J. S., aged 39 (under the care of Dr. Ferrier, notes by Dr. Head), suffering from occipital pain, failing sight, unsteadiness of gait, and marked loss of muscular sense. A necropsy made in March, 1894, showed a tumour of the pons and medulla pressing on the middle lobe of the cerebellum and on the peduncles. In July, 1893, he had frequent hallucinations of sense of position. When lying on his back he would insist that he was lying on his face, and would request to be turned over. One day he had an attack of vertigo while lying in bed. There was no movement, but he declared that his head and neck went up, and that at last he stood erect on his feet. This hallucination was very definite to him, and as by this time he had become blind, he could not check his false belief by looking round him. A little later these hallucinations became more complex, and hallucinations of vision and common sensation were added (a) hallucinations as to position: he thinks he is in the erect position (he is in bed), and being pushed forwards as he walks with a load of heavy boards on his back; then he tries to avoid a pit which lies at his feet, into which he fears to fall, owing to the weight on his shoulders; (b) visual hallucinations; he sees men digging a canal close to him; they nearly all have loads on their shoulders; he sees rats, butterflies, and bats, but they do not excite repulsion, and he is pleased, as he thinks his vision is returning; (c) of common sensation; he says his hands are "pulpy," owing to his having picked up maggots; he is constantly wiping them on an imaginary towel after washing them free from maggots; there were no hallucinations of hearing or taste. The hallucinations of vision only lasted for a few days, but there were hallucinations of position from time to time until his death six months later. Beyond the increasing dulness due to increased intracranial pressure from dilatation of the ventricles, there was no further mental change.

GENERAL REMARKS.

It is not my purpose to discuss in this paper the nature of hallucinations in general. It may be noted, however, that the hallucinations in these conditions, as in those of night terrors, are mostly of a simple character. The visual hallucinations were either "faces," the part to which our attention is habitually directed, and of which we retain the most distinct image in our memory, or objects, such as rats and beetles, which from early childhood have been associated with painful emotion and alarm.

The frequency with which the colour "red" appears in connection with them is of interest. In Case i for instance, the beetles had red eyes, and the nurse appeared to be in red flames. Red is also a common colour in connection with visual auræ in epilepsy. The patient, W. E. (Case No. 2) suffered from epileptic fits, and before each fit he always saw an old woman dressed in red. It is also commoner than other colours, so far as my observation goes, in hallucinations in cases of mental excitement. Two epileptic patients, in whom there was some temporary mental excitement, have imagined they visited Heaven. I carefully listened to their remarks, and questioned them about the robes worn, the flowers, etc., and red was the predominant colour with each of them. Blue was much less common, and it was difficult

to get any account of anything green. The hallucinations of hearing were also simple, consisting of bells, rushing water, etc., and when voices were heard the words used were not arranged in complex sentences, but in what may be termed "interjectional" form.

The degrees of depth of "mental dissolution" were well illustrated in many of the cases, in which first of all floating bodies were seen as specks, but recognised to be part of the individual. Later they took the form of faces, animals, but were for a time recognised as existing only in the patient's own sensations without external warrant, and later on he fails to recognise that they have anything to do with himself, and refers them to the world outside him, and believes in their existence apart from himself.

Such cases as these have been sometimes claimed as evidence of the peripheral character of hallucinations, that is, that there is not merely a strong revival of the mental idea, but that there is the same actual excitation and chemical change produced in the peripheral organ, such as the retina, as would have been produced had an image of the real object fallen on it. To controvert this theory now would be superfluous, as it has been very completely refuted by Hack Tuke¹¹ and others. It is evident, too, from what has gone before, that we have to do with a condition of the perceptive centres, and not merely with one of the peripheral organs. There is not merely "imperception," failure to perceive the nature of the stimuli, but also a positive factor, the invention, so to speak, of mental images for which the sensory impressions give no warrant, as when Miss C. (Case 1) saw large beetles with bright red eyes instead of ill-defined floating bodies. In the development of illusions in a healthy person, two factors are requisite (a) indefiniteness of the sensory impression; (b) a state of tension of the nervous system, a condition of expectant attention, which may arise from fear, hope, or merely curiosity. It is notorious that the commonest illusions are those met with in a dim light, at a time when one is hoping or fearing to see some object. How often does the belated tourist, walking at night along a tedious road, think that he sees before him the inn where he intends to rest, which resolves itself as he approaches into a clump of trees, and still more often has an inanimate white post alarmed some timorous passer-by, and formed the foundation for a local ghost story which may take years to subside.

Or, in the night, imagining some fear,
How easy is a bush supposed a bear.

Midsummer Night's Dream, Act. v, Sc. 1.

With many children, too, it is a favourite amusement to press their faces into a pillow or cushion, and voluntarily throwing their minds into a condition of expectant attention to construct from the phosphores excited by pressure on the eyeballs visions as evanescent, varying, detailed and picturesque as their dreams: and the practice of many imaginative people to construct faces out of the flames or glowing embers of a fire will occur to everyone.

In the cases which form the subject of this paper also the impressions which formed the basis of the hallucinations were indefinite. The floating bodies in the vitreous are faint and the shadows they throw on the retina ill defined. If there are illusions due to optic atrophy or cataract the dim illumination caused by the affection favours their occurrence. The auditory sounds, buzzing, hissing, etc., are usually also most indefinite, and patients find it difficult to give an exact description of them.

In almost all the cases, too, the other factor, the alteration in the general mental condition, could be observed, the hallucinations passing off with improvement of the general health.

The prognosis is fairly good except in cases where there has been a previous mental break-down, in which case it should be extremely guarded. It should in all cases be treated as a danger signal, and the patient put in as favourable circumstances as possible for securing mental tranquillity.

As regards treatment, the first thing is to endeavour to remove the cause by treatment directed to the organ which is at fault. It has been seen that frequently improvement of the general health is accompanied by the disappearance of the hallucinations, and, to this end, tonics, liberal diet, and, in many cases, change of air and scene may be recommended.

It is very important to see that sleep is not interfered with, and, if this cannot be obtained by natural means, such as inducing fatigue by a sharp walk before bedtime, sleeping draughts may be necessary, and the least harmful in such cases is sulphonal, given in 15-grain doses, given with soup or beef-tea two or three hours before bedtime.

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PRELIMINARY REPORT ON THE SUPRARENAL GLAND, AND THE CAUSATION OF ADDISON'S DISEASE.

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[FROM THE WESTERN INFIRMARY LABORATORY.]

THE function of the suprarenal body or gland is a subject of great obscurity, and any observation which may throw any light on the matter will no doubt be made welcome. It is evident that a correct knowledge of this function will go far to unravel the mystery in which Addison's disease is still enveloped. In the present communication I wish to put on record one or two facts observed in the course of an investigation of the subject, reserving the full account and discussion of the same for future publication.

On making a fresh section of the adrenal body, the extremely vascular character of the inner cortical layer becomes at once apparent. It contrasts strongly with the delicate pearly-looking tissue of the medulla on the one side, and the opaque yellowish external portion of the cortex on the other. The blood seems almost entirely collected in this zone, and that the intravascular pressure is considerable is apparent from the welling forth of the fluid which occurs after section. Further examination reveals that the cells composing this layer are more or less pigmented, highly so in some cases, and but faintly so in others.

The existence of the pigmented cells has long been recognised, but their significance has not, so far as I am aware, been hitherto apprehended. My sections reveal the fact that large numbers of red blood corpuscles make their way into these cells, and are to be found (by suitable methods of staining) in their interior in all stages of regressive metamorphosis, from the completely-formed cell downwards. This is so far seen in the accompanying photograph. The en-

Fig 1.—120 diams. From the suprarenal of a young man. In the glandular cells numbers of small dark bodies are seen, sometimes to the number of five or six: these are red blood corpuscles. For comparison a small bloodvessel is seen containing red corpuscles near right hand corner. The nuclei of the gland cells are obscured by the deposit of pigment.