THE VISCERAL LESIONS OF PURPURA AND ALLIED CONDITIONS.

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INTRODUCTION.

IN his well-known work on *Cutaneous Diseases* (1808) Willan first reported the occurrence of visceral symptoms in a case of purpura of great severity, with vomiting, excruciating abdominal pain, diarrhoea and bloody stools. In addition to purpura, there were "anasarcous swellings on the thighs and hands," evidently angio-neurotic oedema, and on the back of the hands two gangrenous sloughs. It is particularly interesting that Willan should have thus noted the polymorphous character of the skin eruption. Olivier (d'Angers),¹ in 1827, gave a good account of the abdominal complications of purpura; and Hensch,² 1874, and Couty,³ 1876, described the cases more fully, and now the combination of purpura with abdominal pains is called after the late distinguished Berlin paediatrist. Since then there have been scores of communications; I have myself reported long series of cases;⁴ and Pratt has given a good summary of our present knowledge in vol. iv of my *System of Medicine*. The general literature of purpura to 1909 is given in the first and second series of the *Index Catalogue of the Surgeon-General's Library*. An excellent analysis of the recorded cases with abdominal symptoms to 1889 is given by v. Dusch and Hoche in the *Henoch Festschrift*, Berlin, 1890.

CHARACTER OF THE SKIN LESIONS.

From the anatomical standpoint four lesions are met with in the cases under consideration. All are exudative, in which the blood elements—either the red blood corpuscles alone, the serum alone, or both combined—pass out of the vessels.

1. Purpura.

This, the most common lesion, is either simple or associated with swelling, purpura urticans, and with oedema of the hands and feet or about the joints, particularly the knees and elbows. The larger areas may be capped with bullae—purpura bullosa. There are cases in which the vesicular character of the purpura is very striking. A man aged 34 was admitted in his fourth severe attack of purpura. The backs of the hands were covered with simple purpura; just below the right elbow was a fresh eruption of blebs looking like herpes, some on hyperaemic, some on purpuric bases. Two inches above the left condyle was a patch of pearly vesicles, solid, not on reddened base; above the joint of the other elbow was a raised bulla 2 cm. by 7 mm. with haemorrhagic contents. Over the right second rib were two patches of pemphigoid purpura, one 2 by 3 cm., the other 1½ cm. in length. Practically all varieties of purpura are seen, reaching to the severest grade of morbus maculosus werlhoffii.

2. Effusion.

Effusions of serum alone, forming the ordinary wheals of urticaria or the patches of angio-neurotic oedema, are the next in frequency of occurrence. The clinical features may be those of ordinary urticaria or of angio-neurotic oedema.

3. Erythema.

Erythema, either diffuse and with or without swelling, or localized, as in the common form of erythema exudativum multiforme; sometimes patches have the appearance of erythema nodosum. In Case XIII⁵ of my series a patient had attacks of violent colic for months without skin lesions, and then was admitted with a typical attack of erythema multiforme on hands, forearms, face; on the legs some of the patches were exactly like erythema nodosum.

4. Necrotic Areas.

When a localized infiltration of blood and serum is very intense in a patch of considerable size, bullae form and the superficial layers of the skin necrose, leaving an open ulcer.

This is more frequently seen in the severer types of purpura, with large serous exudation, but it may occur in intense erythema, as in that most typical of all varieties, chilblains.

There are two outstanding clinical features—first, the recurrence of attacks at long or short intervals over periods ranging from a few months to many years, and secondly, the morphological inconstancy of the skin lesions. In Willan's case purpura, angio-neurotic oedema, and necrotic sloughs were present in one attack. Within a few weeks the patient may run the gamut of a skin atlas—purpura, oedema, exudative erythema, pemphigoid lesions, etc.; or in the same individual followed for many years the skin lesions may differ in the different attacks. Very many of my reported cases followed for years have shown these polymorphic characters.

Even the unusually stable, hereditary form of angio-neurotic oedema may present erythematous lesions of the worst type. For years I had correspondence with a Mrs. W., aged 54, of California, a victim of aggravated angio-neurotic oedema of twenty years' standing; a case illustrating how terrible the disease may be. Her mother had the same affection. The attack began when she was 27, after the birth of her second child. Oedema would come on at any time, anywhere, accompanied with severe vomiting, often of blood. Tea, coffee, or strawberries would bring on an attack within three hours. The face and throat were much affected. The attacks usually began with red spots like wheals on the cheeks. The outlines of the neck would be obliterated. She came into hospital, October 4th, 1904, in an attack, with infiltration of the inner side of the left arm and elbow, with black and blue spots, and the right arm enormously oedematous, with a vivid erythema extending up and down the arm. There was no fever, no enlargement of the spleen, no albumin in the urine. A specially interesting thing was to find that this patient belonged to the New Jersey family of hereditary angio-neurotic oedema, which I described in 1888.⁶ She was the great-great-granddaughter of the man, aged 92 (who had been taken as a boy to see the famous Benjamin Rush), who so kindly worked out for me the family history. It is worth noting that another member of this family had had her appendix removed for the colic associated with oedema, and two had died of oedema of the glottis.

VISCERAL LESIONS.

The visceral lesions are of two types. First, mechanical, due to the presence of exudate in the walls of the stomach or intestine, effusion of blood on a mucous surface, or into the substance of an organ; secondly, inflammatory, as nephritis, less often endocarditis, pleurisy, pericarditis, pneumonia, or peritonitis.

The cases have a dual etiology, infectious and metabolic. Purpura, with or without erythema and exudative lesions, may follow gonorrhoea, otitis media, parturition, phimosis, and local lesions of the skin. The rheumatic poison is believed to be responsible for a large group; and in the case of a child with severe purpura in the third and again in the fifth year, chorea in the sixth without endocarditis, severe urticaria in the same year with ill-health, chills, fever, and well-marked endocarditis, such a view is probably correct. The arthritis, too, is held to indicate the same cause, but it may have a very different explanation. The bacteriological examination of these cases has not been very satisfactory—no unanimity has been reached as to the organisms. On the other hand, there is a large group in which the lesions are an expression of perverted metabolism. Chronic angio-neurotic oedema, urticaria, and some forms of purpura are possibly anaphylactic phenomena in persons sensitized for certain protein substances. It is interesting to note that experimental sensitization may be transmitted. Hay fever, the idiosyncrasy to iodine, quinine, to strawberries and shellfish, are all manifestations of this supersensitiveness. The phenomena of serum sickness reproduce in a graphic way the features of the skin diseases which the French group under erythema. The local oedemas, the urticaria, the purpura, the arthritis, the vomiting, and the persistence for years of the sensitiveness, are paralleled by the lifelong liability to recurrence in some cases of angio-neurotic oedema and of purpura.

The diverse localization, the variable character of the exudate, now serum alone, now blood, or blood and serum together, are points that await explanation. The actual exudate is conditioned by the epithelial cells of the capillary wall, damaged by a circulating poison, as so well shown in experiments with snake venom. But it may only be some such subtle change in the blood serum as takes place in the peripheral circulation in paroxysmal haemoglobinaemia. In one patient exposure to a temperature near the freezing point at once brought out a crop of urticaria on the face; and Wild⁷ reports a severe purpura following exposure to a great heat. Before long the anaphylactic key will unlock the mystery of these cases. The malignant purpura of the specific fevers and of the rare primary form may be anaphylactic phenomena. The following observation bears out the idea that the primary action of the noxious agent is on the epithelial wall. In a case of purpura fulminans seen with Dr. Brock at Rome⁸ the skin was plum-coloured on the third day. Having abdominal distress at the outset, the man had put a large mustard leaf below the navel, which had reddened but not blistered an area of skin 6 by 8 inches. Everywhere else but into the skin of this region haemorrhage had occurred. The same blood had circulated, but the stimulating influence of the mustard had effected a change in the capillary walls of the area, enabling them to resist an injury to which all others had succumbed.

Cerebral Manifestations.

There are two groups of cases—the one with transient attacks of paresis, such as occur in Raynaud's disease and in arterio-sclerosis; the other in which the paralysis is due to coarse haemorrhage.

In Case xv⁹ a man, aged 29, had had from the age of 12 recurring attacks of urticaria, angio-neurotic oedema, colic, purpura, haematuria, and albuminuria. When 13 he had a sudden attack of hemiplegia, which lasted for twenty-four hours, and during the year he had five or six attacks, in which for a few hours or for an entire day he lost the power of the arm or leg, usually on the left side. Some of these occurred in association with outbreaks of oedema.

It is possible that the following case is of the same nature:

Recurring Purpura for Six Years; Hemiplegia in an Attack; Angio-neurotic Oedema of Arms, Hands, and Feet.

Mrs. M. E. C., aged 69, seen with Dr. Cameron, October 5th, 1903.

The patient was a very healthy woman, of good family history. She had had five children. She was very strong and well until six years ago, since when she had had recurring attacks of purpura on the legs and feet, rarely on the hands or face. Once she had a few spots on the conjunctivae. Never during this entire period for more than a week or ten days has the skin of the legs not shown haemorrhages. They came out in successive crops, and were usually associated with marked swelling of the feet. At first there was no swelling of the joints, but lately the knees and ankles have been painful and swollen in the attacks. She had seen scores of doctors, and in consequence of the attacks had become progressively debilitated.

For the past two years she had had on the arms and face remarkable swellings. In a few hours the hands would swell to such an extent that to take off the dress the sleeve had to be ripped. Big knot-like swellings as large as an egg would appear on the forehead, and the elbows and the knees would frequently swell. These swellings were never red, and there was never purpura with them. They would often coincide with a severe outbreak of purpura on the legs.

Two years ago, during the onset of an unusually severe outbreak of purpura, she had an attack with slight loss of consciousness, and for two days could not speak, and there was paresis of the right side, which gradually disappeared, and she got quite well. She had had at intervals bad bronchial attacks, but never colic.

She was a very thin, delicate-looking woman, pale and sallow. The pulse was regular, the heart's action fairly strong and regular. There was no swelling of the gums. The legs, from the knees down, were swollen, both ankles were enlarged, and the right little finger. From the hips to the toes the skin was of a very dark colour, from old faded haemorrhages, and there was an outbreak of fresh

purpura in many places, very thickly set over the ankles, almost uniform. There was no heart murmur; no enlargement of the spleen or of the liver.

Coarse haemorrhage into the brain is not very common in purpura, but there are a good many cases in the literature;¹⁰ I have notes of only three.

Purpura Haemorrhagica, Hemiplegia.

On February 27th, 1902, I saw, with Dr. Wegefarth and Dr. Thayer, Mr. F., aged 21. The condition was as follows: Resting on his left side, apparently sleeping, he could not be roused to consciousness. Blood was trickling from the left nostril; both had been plugged. He was breathing 24 to the minute; the pulse was 56, rather jerky. The superficial veins of the hands were very full. The pupils were dilated and inactive. The face was covered with numerous petechiae, of large size. There were many bluish subcutaneous haemorrhages, and one or two subconjunctival. The skin of the body generally presented numerous petechiae, and in places quite large blotches of haemorrhage. On the thighs there were large subcutaneous infiltrations. On the back haemorrhages had occurred into the acne spots, many of which were capped with haemorrhagic scabs. There was bleeding from the gums, and there were haemorrhages beneath the submucosa of the lips. In a basin near by there was half a pint of dark, bloody fluid, and a large fresh clot was attached to the plug in the nostril. On turning him over, the left arm seemed specially limp, and he did not move it; it dropped "dead," and was much more relaxed than on the other side. No difference in the facial muscles. The left leg seemed more relaxed than the other, and the nurse said that he had not moved the limb on that side since morning.

The patient had been a healthy young fellow. There was no history of bleeding in the family. When a child of 2, after a fit of passion, he had had an attack of haemorrhage from the stomach. He had had occasional "nose-bleed," but nothing of any moment. Three weeks ago he had bleeding from the nose, which had been rather troublesome. On Sunday, February 23rd, he had recurrence, and Dr. Wegefarth had to plug the nostrils. On Monday and Tuesday it was noticed that he had a few petechial spots about his face and legs. On Tuesday and Wednesday he was up and about, but he had a little bleeding from the gums. On Wednesday the haemorrhages into the skin became more abundant; he had bleeding from the nose and from gums, and in the evening he began to have vomiting of blood, and has vomited four or five times since. He became very much worse to-day, and has been comatose. The blood coagulation time was not specially delayed.

Recurring Epistaxis, Purpura, Hemiplegia, Haemorrhage into the Brain.

In a case of Dr. Bressler's a man, aged 63, had occasionally had rheumatism, and for some months before his fatal illness recurring epistaxis. He then began to have bleeding from the mouth and gums, with purple spots over the body. When seen on June 28th he was pale, the body covered with numerous purpuric spots, the left foot swollen. The examination of the organs was negative. On July 4th, at 9 p.m., he had convulsions, limited to the left side. He became deeply comatose and unconscious; the paralysis persisted, and he died on July 5th.

At the autopsy the viscera looked healthy. On the right side of the brain there was a large subdural haemorrhage, covering the whole of the dura and the outer part of the frontal lobe. Immediately behind the fissure of Rolando was a clot as big as a walnut extending into the brain substance.

Attacks of Purpura in the 7th Year, with Nausea and Colic; when 16 admitted with Purpura, Vomiting, Colic, Aphasia, and Right Hemiplegia; Operation; Death.

C. B., aged 16, admitted March 24th, 1904, with paralysis on the right side, aphasia, and blotches of haemorrhage in the skin. No history of haemorrhages in the family.

She was healthy until her 7th year, when she had scarlet fever, not a severe attack, after which purple spots began to appear periodically, sometimes once a month, sometimes less frequently, scattered over the body, face, and arms. The spots ranged in size from a small coin to the palm of the hand. She was treated for this trouble in the out-patient department on

March 20th, 1897, and in June, 1897. In both of these attacks there was a history also of nausea and vomiting and abdominal pain. She had also bleeding from the nose. On March 24th, 1904, she was admitted, giving a history of having had the same recurrences of the skin trouble, and occasionally with attacks of nausea, vomiting, and pain. In one of these attacks in February of this year she had pain and swelling in the left ankle-joint, but no redness. She has only menstruated once, when she was about 12 years old.

She looks a strong, well-developed girl. The present illness began on March 22nd. She had been in her usual health, and had gone out to an evening party with some friends. Returning, she became suddenly unable to speak clearly. She herself was aware of this, and said that there was some difficulty in swallowing. She slept restlessly, and on the 23rd still had an inability to get the right word; no trouble in walking. On Thursday morning, the 24th, she was not so well, but she walked a considerable distance to the hospital. It was found that she could not speak. She moved her right hand and forearm a little, but she could not raise the arm to her head. There was no sign of paralysis of the face or of the leg. During the examination in the out-patient department she had a severe convulsion, beginning on the right side of the face and involving the arm and the hand. She had a second convulsion shortly afterwards, after which she became unconscious. There were numerous haemorrhages scattered over the skin, particularly on the chest, along the arms, and several large areas on the legs. The gums were not swollen; no bleeding from the mucous membranes. The blood count after admission gave red blood corpuscles 4,500,000, leucocytes 14,800, haemoglobin 20 per cent.; blood coagulation time 14½ minutes. Blood pressure 125 mm. The physical examination of the thorax and abdomen was negative. The spleen was not enlarged.

On the following morning I saw the patient at the ward visit. There was no sign of paralysis of the face. She could not speak, and she took very little interest in her surroundings. The right leg was not paralysed. I was proceeding to examine her chest when she began to twitch the forefinger of the right hand; then the fingers extended, the arm began to twitch, the head turned to the right, the eyes became staring, and in a few moments she had a general convulsion. She lay in a state of coma all day, and had five convulsions. Fresh haemorrhages appeared over the skin of the body and limbs. The condition seemed to justify operation in the hope that it was a cortical clot. Dr. Cushing exposed the left motor area, and found the dura very tense and the brain and subpial space of a uniform deep cherry colour, but no free clot. For the next three days she seemed better. There were no fresh convulsions, and she seemed to understand what was said, and on the 26th she made attempts at talking. She gradually became more comatose, and died on the 29th. There was no autopsy. The urine contained a trace of albumin, but no tube casts.

OCULAR LESIONS.

In anaemia and leukaemia, in cachectic states, and in arterio-sclerosis retinal haemorrhage is common, conjunctival less frequent. In the haemorrhagic types of the specific fevers extensive bleeding may take place, and in black small-pox I have seen the corneae sunk in a wall of subconjunctival haemorrhage. When in ophthalmic doubt I turn to de Schweinitz, but even in his encyclopaedic handbook I can find no reference to some of the complications here described, and the cases indicate how serious may be the lesions in the forms of skin disease under consideration.

In purpura haemorrhagica bleeding may take place into the eyeball. In the fatal case seen with Dr. Wegefarrth and Dr. Thayer the right eye was completely filled with blood clot.

Recurring Purpura for Years; Haemorrhage from the Conjunctiva.

A woman, aged 63 (seen with Dr. F. F. Smith), whose mother and twin sister had both died of purpura, began to have haemorrhages when about 54, passing blood occasionally from the bowels and from the kidneys. Two years later she had severe attacks of epistaxis. In 1902 she had haemorrhage from the right conjunctiva for twelve days, which was only controlled by compresses. When I saw her she had had severe pains in the legs and had had outbreaks of purpura in the course of the superficial nerves.

Purpura Haemorrhagica, Haemorrhages into Right Eye with Detachment of Retina.

In a severe and fatal case of purpura, Frank A., aged 22, admitted January 1st, 1895, Dr. Randolph reported on January 5th widespread haemorrhages in the right eye with detachment of the retina on the inner and lower half; many retinal haemorrhages also in the left eye.

There is another group of extraordinary interest in which the eyes are seriously inflamed in connexion with the skin lesions of the erythema group. The cases are rare.

Recurring Colic; Angio-neurotic Oedema and Erythema on and off for Five Years; Freedom for a Couple of Years; Recurrence with Iritis and Retinal Haemorrhage; Ophthalmitis; Removal of Eye.

On March 30th, 1901, I saw P. M. M., aged 41, a patient of Dr. Billings and Dr. George Fiske of Chicago, who had had a very chequered medical history. During 1890, at intervals, he had severe attacks of colic, and appendicitis was suspected. Previous to this he had had once an eruption on the skin. In 1891 swellings appeared in the fleshy part of the legs, which were sometimes red, sometimes not. They were called erythema, and in one attack the well-known dermatologist, Dr. Hyde, diagnosed erythema nodosum. With the attacks he had iritis of great severity. These attacks recurred during the next few years, so that his life was a burden. He sometimes had severe pharyngitis. In September, 1895, with swellings in the calves and thighs, sometimes red, sometimes not, and stiff ankles, he had iritis and acute orchitis. At Christmas, 1895, he had choroido-retinitis. Then for a year or two he was better. The attacks recurred in April, 1900. He was operated upon for iritis, and in May, 1900, the left eye had to be taken out. He was better until January, 1901, though he had slight attacks of the swellings; then the right eye became involved—slight retinal haemorrhages—and he was again threatened with iritis. In October and November he was much troubled with the swellings, which would come and go, appearing suddenly and lasting eight or ten hours, recurring during three or four days—evidently in part haemorrhagic, as the skin was often left with a deep brown stain. He had several slight attacks of swellings about the elbows and once on the thumb. A month ago he appeared to have a slight erosion on the cornea. Of the patient's two children, one has had swellings in the right leg and in the thigh, very like those that afflicted the father. There have been no changes in the blood or in the urine. He has tried all possible plans of treatment without receiving any benefit.

There can be no doubt that this case belongs to the group under consideration. The swellings sometimes resembled erythema nodosum, sometimes angio-neurotic oedema. How tragic this ocular association may be is shown by the following case.

On Third Day of Febrile Attack, Purpura, Iritis, with Ocular Haemorrhage; Blindness.

Mary E., aged 8, seen May 21st, with Dr. Jones of Mount Washington. She had been a healthy girl, with good family history. She was seen first by the doctor in a slight febrile attack without any local features. On the third day there was an outbreak of purpura all over the body, some spots as large as 8 or 10 mm. in diameter and slightly raised. The hands and wrists and ankles were swollen. She became delirious, and was very ill. On the third day of the attack haemorrhagic spots appeared on the conjunctivae, and there was intense pain in the eyes.

Dr. Randolph determined the presence of iritis with severe haemorrhage. The condition of the eyes grew rapidly worse, and within three days the sight was completely lost. The child remained very ill for seven weeks, with recurring attacks of purpura. After the first week the fever was slight, there were no changes in the urine, and the child gradually recovered, but with extensive degeneration in both eyeballs—the lenses opaque and adherent to the irides.

In this last case, also of great severity, the child has fortunately recovered with some vision.

Purpura; Colic; Infiltrated Areas of Skin with Necrosis; Acute Iritis and Capsulitis.

R. A., aged 7, admitted to the Radcliffe Infirmary under Dr. Mallam on May 21st, 1912.

On Friday, May 17th, he was at school. In the evening he complained of pains in the legs, and was much disturbed all night. He was seen by Dr. Venning of Steeple Aston on Saturday, and throughout that day and on Sunday he became much worse; there were vomiting and diarrhoea; the temperature rose on Saturday, and in the evening he became delirious. On Sunday his mother first noticed purple patches on the skin, and on that day he began to complain of pain in the eyes, but they looked all right on Monday. As he seemed very ill, and the temperature was rising, he was sent in to the infirmary. There were purpuric spots on the arms and legs, and several large ones formed by the coalescence of smaller ones. On the right shoulder was a raised patch with a deep inflammatory base, 4 cm. in length by 2 cm. in width, covered by a haemorrhagic bleb. There were three others of this character, one on the right leg and two on the buttocks. The right shoulder was slightly swollen, both elbows tender, but the skin not red.

The following is an abstract of Mr. Adams's note on the eyes: Corneae dull and steamy, conjunctivae injected, anterior chambers filled with a cloudy exudate which hides the iris except at the periphery. In the left eye inflammation not so intense, but a film of exudate spreads over the iris, and there was a collection of yellowish material in the lower half of the anterior chamber, but without a straight margin, as in hypopyon. In neither eye is there much ciliary injection. On the 23rd both eyes were better, the corneae brighter, but there were central films of opacity on the anterior capsule of the lens, and the cornea of the right eye was still dull.

For the first two days in hospital the temperature ranged between 102.5° and 103°. On the 23rd he was given 20 c.cm. of an antistreptococcic serum. On the 24th the right elbow was more swollen and the left elbow was also stiff. The skin spots were subsiding, but the larger areas were covered with haemorrhagic blebs. On the 25th he had an attack of abdominal pain. The large patch on the skin of the right shoulder was less swollen, but presented a dirty-looking necrotic centre. The blood count was: Red blood corpuscles, 3 millions; haemoglobin, 50 per cent.; leucocytes, 13,100. The spleen was not enlarged. On the 25th and 26th the temperature remained about 101°; on the 27th, 28th, and 29th it fell, and became normal on June 2nd.

On June 1st Mr. Adams's eye note was: *Left eye*, cornea bright, central opacity on anterior capsule of lens is smaller. *Right eye*, iris still very muddy, pupil irregular, much injection of the cornea and conjunctiva. The patient's general condition was much better, and from this time on he improved rapidly.

GASTRO-INTESTINAL SYMPTOMS.

To these, the most distressing though not the most dangerous of the visceral complications, the name of Henoch is given when associated with purpura, though they occur with any member of the erythema group of skin lesions. The manifestations may be for years abdominal without skin eruptions.

Colic is the common symptom, and occurred in 25 out of 29 cases analysed in 1904.¹¹ The attacks may be transient, lasting only a few minutes, but recurring several times during the course of the day. They may be of great severity, causing the patient to writhe in the bed. They occur most frequently at night. The attacks are independent of diet, and occur with the skin rash or in the intervals of the outbreaks until the rash fades. In protracted cases the colic may not appear for a couple of months, and then be very severe. The position of the pain is usually central, and may radiate to all parts; very often the child cannot fix upon the spot accurately. I have never met with an instance in which the pain was limited to the right iliac fossa. The abdomen is usually flat, not painful on pressure, without increase in the muscle tension, though it may often be difficult to palpate the child satisfactorily. There may be marked tenderness along the transverse colon.

Vomiting, with or without pain, is perhaps quite as frequent as colic, with which it is very often associated. If the child has eaten recently, the food is vomited with mucus and watery fluid, and, if the vomiting is very severe, flakes of blood. It may be frequent, without pain, and there are remarkable gastric crises such as I described in Case I of my first series,¹² in which, with

the colic and vomiting, the patient had fever and delirium. In some attacks there were no skin lesions.

Vomiting of blood is common enough in severe types of purpura. It may also occur in connexion with colic in milder forms which have no extensive cutaneous haemorrhages or bleeding from other mucous surfaces.

Diarrhoea, which is not nearly so common as vomiting, is of two types; increased frequency of the stools, either lenteric or watery, three to six in the day, with blood and mucus. With severe purpura the blood may be in large amount, colouring the entire stool, and very little changed. In the ordinary cases with the colic the stools contain mucus streaked with blood. In connexion with the diagnosis the colic, frequency of the stools, and the blood may be highly suggestive of intussusception, for which, indeed, operation has been performed.

The study of the conditions under which the gastro-intestinal crises occur is of special importance. It may be useful to group them as follows:

First, *cases without skin lesions*. On several occasions I have drawn attention to this interesting type. In Case I, a man aged 27 had for six years attacks of colic with diarrhoea, always associated with raised blotches of erythema, forming large wheals and wheals, which turned black. For two years he has had the abdominal pains without any skin lesions. In Case XIII the patient was operated upon in November, 1896, for an ovarian tumour, and one week after she had the first attack of abdominal pain, and two subsequently while she was in hospital, in each of which morphine had to be given. For six months the attacks recurred every week or ten days, often of such severity that she had to cry out. It was a dry colic, and never associated with a skin rash. Then on June 3rd she was admitted to hospital with fever in an outbreak of typical exudative erythema—hands and feet, face and neck. The attack was very severe, but she recovered after two relapses. Subsequently she had very little colic, but in 1931, in Russia, she had haemorrhage from the stomach. On February 12th, 1902, while leaving the theatre, she had profuse haematemesis, which was repeated during the night. The next morning I saw her in a state of profound anaemia, with the most striking cadaveric odour I have ever noted. She died that evening. In Case XVIII,¹³ a child, aged 7, had swellings of the knees in the first year; from the second to the seventh recurring attacks of abdominal pain with vomiting, but no skin rashes; admitted in an attack of pain, with vomiting, with purpura and urticaria, outbreaks of which occurred during her admission. The following is an illustrative case in which the gastro-intestinal attacks were of great severity, occurring at intervals of from a few weeks to two or three months between the first and tenth years; the skin lesions were only occasionally present.

Attacks of Fever with Colic and Gastro-intestinal Trouble from 1st to 10th Year; Recurring Outbreaks of Urticaria, Purpura, and a Vesicular Rash; Good Health in the Intervals; Gradual Recovery.

Alex. L. C., aged 10, seen May 11th, 1908, with Dr. Moorhead of Bath, was a healthy baby; weighed 8½ lb., but did not thrive till weaned. From the first year he has had recurring attacks of gastro-intestinal trouble, beginning usually with slight fever for one day, then abdominal pain of a colicky character, sometimes with a shivering fit so that the bed would shake; not often vomiting, usually some diarrhoea. The fever persists for two or three days, the pain for four or five. The abdomen sometimes becomes swollen. The stools often contain large quantities of mucus, and in one of the worst attacks which he had at 5 years there was blood. The urine was never abnormal. He has never had any swelling of the joints. These attacks have recurred at intervals of from a few weeks to two or three months ever since his first year. With many of the attacks he has had remarkable skin rashes, most frequently like ordinary hives occurring on the legs and arms, and they come out in successive crops. On several occasions the skin eruption has been purple, and the spots persisted. In one attack the diagnosis was made of chicken-pox, as the arms and legs and the entire trunk were covered with small spots which became vesiculated. In the intervals between the attacks he is very well. His mother thinks that diet has no special influence.

There is nothing in the family history; there are two other healthy children. He is a well-grown boy with a good colour, and weighs $4\frac{1}{2}$ st.; the tongue is clean; teeth are good; skin of the face clear; the chest is well formed, good expansion; abdomen natural looking, no distension, everywhere soft, no tenderness; descending colon readily felt; spleen not palpable; pylorus not palpable; no distension anywhere of the colon; liver is not enlarged; right kidney just palpable; upper limit of liver flatness is on the fifth; apex beat of heart in normal situation; no enlargement of organ; heart sounds are clear; joints not enlarged, nowhere tender; no fibroid nodules; the skin is everywhere clear, nowhere any trace of old spots. The attacks are evidently of great severity, but they are fortunately lessening. He only had two in 1907, and has had no attacks since November. His stay at Bath has improved his general health very much, and he looks now in good condition. I heard of this case two years later; the attacks have diminished in frequency, and he has grown much stronger.

It is quite possible that certain cases of children with obscure cramps may belong to this type. In my third paper¹⁴ I have referred to a family in which the mother, until puberty, had attacks of colic and vomiting. Three children have had lives very badly, and the boy, aged 13, had had for nine years, at intervals of from a month or two, sometimes for a couple of weeks, every day severe colic, occasionally of extreme severity. There was never pain in skin rash.

Secondly, in association with haemophilia. In this disease, as is well known, it is not simply a matter of bleeding from accidental blows or cuts, but there are spontaneous haemorrhages, cutaneous, arthritic, and visceral. With the latter the symptoms may suggest the acute abdomen. I saw on his deathbed a few months ago, with Dr. Birch, a boy, a bleeder from infancy, who had twice had haemorrhage into the peritoneum, once producing a condition highly suggestive of acute peritonitis.

In Larned's¹⁵ case a haemophilic subject on August 24th, 1907, had a curious abdominal attack which was diagnosed Henoch's purpura. There was general abdominal pain and distension. There was no marked muscle spasm in the right iliac fossa, and no special point of tenderness.

One is doubtful whether this was really a case of haemophilia, according to the more strict definition introduced by Bulloch, as the history is somewhat indefinite, and both women and men of the family have bled; yet the patient had had frequent epistaxis, there had been difficulty in checking bleeding from slight wounds, and in 1902 he nearly bled to death after an operation for ingrowing toenail.

An Oxford patient, evidently a bleeder, frequently admitted to the Radcliffe Infirmary, has had on several occasions severe attacks of abdominal pain. On September 17th, 1905, he noticed pain in the abdomen; on the 18th, 19th, and 20th the pain was severe, and he remained in bed. The bowels were loose, and the stools were dark-coloured. On the 21st he was sick at the stomach, and the vomitus was blood-stained; on the morning of the 23rd the pain was again very severe, requiring a third of a grain of morphine for its relief. There was a large subcutaneous haemorrhage along the inner side of the left leg; there were no other haemorrhages. The colic recurred at intervals in less severe attacks for a week or more, and gradually disappeared. Twice before he has had attacks similar to the present, the last one three years ago, and both associated with blood in the vomitus and in the stools. He has had altogether four or five attacks of this character.

In this family, the history of which was worked out by the late Dr. Leckey, there was no trace of a bleeder. The mother knew of no case in her family, in which there is a marked tuberculosis history. She has two sons and two daughters; both of the sons, of whom the younger is the patient, have shown from birth a marked tendency to bleed. The father states that they were never expected to live, as they bled profusely from cuts, often from the nose; slight bruises would be followed by enormous haemorrhages beneath the skin; extraction of teeth in both was followed by protracted bleeding. The brother, who had had epistaxis, cutaneous haemorrhages, and bleedings into the joints, accompanied with great

pain, became tuberculous and had profuse haemoptysis, and died at the age of 27.

The patient himself I have seen frequently, and it is difficult to escape the conclusion that both he and his brother were genuine bleeders. He has had all varieties of bleeding—cutaneous, spontaneous blotches, has bled profusely from accidental cuts, after extraction of the teeth, and slight blows would be followed by enormous bruises. He has had many attacks of swelling of the knees, with pain and haemorrhage into and about them.

Thirdly, with ordinary urticaria. I have seen a number of cases illustrating this association. No. xiv of my reported series, a physician, in whose case I was very much interested, had from his twentieth year, at intervals of a few months, most extraordinary outbreaks of urticaria, with nausea, vomiting, and abdominal pain. He finally died in an attack which began in the usual way, persisted, and passed into one of fatal purpura haemorrhagica.

For Five Years recurring Attacks of Urticaria, with much Oedema, Vomiting, and Abdominal Distress.

I saw on October 25th, 1901, a man who to the age of 45 had been very healthy, without special digestive disturbance. For five years his life had been a burden with recurring attacks of urticaria, associated with vomiting of an aggravated type. For an hour or two before the attack he has a feeling of uneasiness, sometimes shivering, or even a positive chill, then the wheals come out over all parts, as a rule several hours before the vomiting comes on. In bad attacks the skin rash is very extensive; the whole body appears swollen, the hands are puffy and covered with red and oedematous blotches, the lips are swollen and stiff. The vomiting lasts from ten to twenty-four hours; nothing stays on the stomach; there is never actual pain, but a great deal of distress with the vomiting. He has never been jaundiced, and he had no diarrhoea. At first he thought that indiscretion in diet brought on the attacks, but regulating the food had been tried without success. In the five years the longest interval between the attacks was three and a half months; he has had one every month for the past six months. He was very large and stout when the attacks came on, and in the five years he lost 70 lb. in weight! He now looks a man in excellent health; good colour, with clean tongue; and the most careful examination revealed nothing wrong in any of his systems. His blood coagulation time was normal. Prolonged treatment with grey powder and calcium lactate gave him great relief, and he passed several months without an attack.

A very similar case has been reported by Dr. J. J. Pringle. For nearly fourteen years a man had recurring attacks of urticaria of great intensity, with many of which there was profuse haematemesis. I heard from Dr. Pringle recently that this patient has recovered completely, and is now a healthy man of 80 years.

Fourthly, *angio-neurotic oedema*. In the ordinary forms in which there is transient oedema of the eyelid, or of the forehead, or of one hand, there is not often colic, but in the severer varieties the gastro-intestinal crises may be a special feature. I have already referred to it in the family form, in which it is—apparently very common. The abdominal attacks may occur alone, or with very slight swelling. The following is a good illustration, occurring also in the familial variety.

Father and Sister the Subjects of Angio-neurotic Oedema. Attacks from the Fourth Year of great severity, usually of Oedema, but sometimes Erythema, associated at times with Vomiting and Pain.

Miss F., aged 58, referred to me April 7th, 1910, by Dr. Martyn of Exmouth, who wished me to study the case, knowing my interest in the subject.

Family History.—Father died at 86 of strangulated hernia. He had been subject to attacks of swelling all through his life. The daughter had seen him in many of these. Sometimes one arm would swell to double the natural size. Some of the attacks were of great severity, and associated with great pain in the abdomen and sickness. They did not diminish as he grew older, and he rarely passed a month without an attack. His mother was not subject to it. The family consists of one brother and two sisters. The brother has never been attacked. The sister, now aged 60, began to have attacks at her 29th year. The swellings are chiefly in the hands and feet, and she only occasionally has vomiting and diarrhoea with them. She has six children, none of whom have been affected.

The patient began to have attacks at the age of 4; all through her childhood she was greatly troubled, and of late years they have recurred with great frequency. At one time she would pass six weeks or two months without an attack, then they came on one in a month, then every ten or twelve days; now she rarely passes a week without swelling somewhere. They come on any part of the body, not so much on the face now as formerly. She has had attacks which were supposed to be erysipelas, so swollen, red, puffy, and oedematous were the eyelids and face. Now the attacks are generally in the hands or arms or somewhere on the trunk. She can tell a little while before they come on, as she feels very heavy and dull and has attacks of yawning. The swelling lasts for from three to six hours, rarely for twenty-four or thirty-six. The spots are generally pale-looking, occasionally red and shining. She never remembers to have seen red or black spots, nor has she had any haemorrhage from the mucous membrane. As a rule with the swelling there is an uneasy sensation in the abdomen, often amounting to actual colic; then she has retching and vomiting, but never diarrhoea. She has had severe abdominal attacks without the skin swelling.

Fifthly, the largest group in which the gastro-intestinal symptoms occur in connexion with simple purpura with or without urticaria. To-day the frequency with which these attacks are mistaken for appendicitis makes the condition important. Take, for example, the following case, which I saw preliminary to the surgeon being called in, as the symptoms were so suggestive of the acute abdomen.

H. V., aged 15, seen with Dr. Wainwright, May 23rd, 1908. He has been always strong and well, with the exception of a tendency from the sixth month of age to what his mother calls the "bumps." On and off, at intervals of from a few weeks to six months, spots came out over the skin, sometimes like ordinary hives, sometimes like flea-bites. He has never had a very severe attack. The mother attributed the condition to indiscretions in diet. Lately he has had, as a rule, two or three attacks a year, most commonly on the arms and legs. They take two or three days to disappear, and sometimes come out in crops. Early in May he was at Brighton, and he complained of some pains in the legs and wrists. Shortly after May 12th the attack came on with slight fever, and he had to go to bed. The next day he was covered—arms, legs, and back of the neck—with bright red spots, the individual ones raised with marked erythema between them. They began to fade and left the skin stained. Every few days there have been recurrences. The last crop came out yesterday. On the 13th he began to have pain in the abdomen, not localized, not associated with vomiting, and not increased by food. During the next few days it became more intense, occurring in paroxysms, and on the 19th he had several very severe attacks, and appendicitis was suspected. The abdomen was never distended. It was tender in the flanks below the costal border, not over the appendix. He had no vomiting, no diarrhoea, but the stools were singularly offensive. On the 20th he passed a small mass like orange pulp streaked with blood. The urine was normal. On the 12th and 13th the temperature was normal, on the 14th, in the evening, 100°; since then it has varied between 99° and 101°. Last night it was 101°, and 100° this morning. At 4 o'clock yesterday morning he had a slight chilly feeling.

Examination.—Rather a delicate-looking boy; tongue lightly furred; a spot like a recent wheal on his left cheek. He does not look very ill, and gives a very good account of himself. *Skin:* Arms and legs covered with fading urticaria and with stains of former patches. On the arms are several fresh spots. The legs to the upper part of the thigh are covered with the same fading stains, and there are a few fresh wheals, no purpura, no spots on the trunk. There is no arthritis. *Abdomen:* Flat, natural looking; respiratory movements a little restricted, but he takes a deep breath without wincing; the appendix region not tender. Nothing abnormal in chest. The boy made a rapid recovery.

The following case was admitted to the surgical ward of the Radcliffe Infirmary:

R. D. B., aged 20, was admitted April 1st, 1912, supposed to have appendicitis or intestinal obstruction. Two weeks before he had had pain in the lower part of the abdomen and had vomited twice.

Last week he again had abdominal pain and slight stiffness and swelling of the calf of the right leg. The abdominal pain had increased, and he was admitted to the surgical ward. There was no distension of the abdomen, but he had pain, and the motions contained some mucus streaked with blood. Within twenty-four hours of admission he complained of stiffness in the elbows, and was found to have purpura, so that he was transferred to Dr. Collier's ward. He was a healthy-looking man of good colour; he complained of pain in the epigastrium and stiffness of the elbows. There were purpuric spots upon the right external malleolus, both elbows, and the left shoulder. One of these patches was large and raised with a diameter of about 1 cm. The heart and lungs were normal; the spleen could not be felt; the liver was not enlarged. The urine had a specific gravity of 1010, with a slight cloud of albumin, no blood. Red blood cells were 5,100,000; haemoglobin, 95 per cent.; leucocytes 11,200.

On the first day after admission he vomited after each meal, and there were streaks of blood. The pain was less, though he had a sharp attack during the night. There was an extension of the purpura both in legs and arms. On April 12th there was a small amount of blood in the stools, and he vomited several times. On April 13th and 14th no vomiting; the purpura was fading, but on the dorsum of the left foot there was a definite haemorrhagic bleb. On April 15th he had an attack of abdominal pain and vomited once. From this time on he improved rapidly, the albumin disappeared from the urine, and he was discharged well on May 1st.

I have known at least five cases admitted to the surgical wards, and many instances of operation for appendicitis have been reported in the literature. Sutherland¹⁶ has collected many of these, and the more recent ones have been collected by Withington¹⁷ and by Seymour Barling.¹⁸ The condition found with operation has been local infiltration of the bowel wall with blood or with serum. In the majority of cases the ileum has been involved. In a case reported by Jacobson¹⁹ the appendix itself was involved in haemorrhagic oedema. In a woman aged 37, with fever and pain in the right side, operation showed an acutely inflamed haemorrhagic appendix. Following the operation the patient had haemoptysis, epistaxis, and an outbreak of purpura.

Lastly, *intussusception* may complicate abdominal purpura or angio-neurotic oedema. One can understand how easily this may follow local infiltration of the bowel wall. Several cases have been operated upon successfully by Tonking,²⁰ Lett,²¹ and Seymour Barling. In Lett's case death followed a second attack of intussusception. Without the characteristic sausage-shaped tumour the diagnosis is difficult, as the frequent small stools of blood and mucus—often, indeed, large amounts of blood—are not uncommon features in abdominal purpura. As the difficulty in examination may be great, in a doubtful case an anaesthetic should be administered. It is well to remember, however, that a palpable tumour may be caused by a massive exudate into the bowel wall itself, Greig's case;²² by a clot in the lumen of the bowel, as in FitzWilliam's case,²³ or by a massive haemorrhage into the mesentery, as reported by Lett. In a case reported by Parkinson²⁴ operation was performed for suspected intussusception. Death occurred on the following day. *General peritonitis* was found with haemorrhages in the walls of both large and small intestines. In a case reported by Vierhuff²⁵ an adult with purpura haemorrhagica and blood in the stools and symptoms of intussusception recovered after passing a piece of the bowel. A remarkable case of peritonitis is reported by Silbermann.²⁶ A child, aged 10, had purpura, arthritis, fever, colic, haemorrhage from the stomach and the bowels; in a relapse there were symptoms of the acute abdomen and of diffused peritonitis. *Post mortem* a small perforation was found in the fundus of the stomach.

RENAL COMPLICATIONS.

These are the most serious of the whole group. I have excluded the haematuria when one of the manifestations of purpura haemorrhagica, that is to say, in cases of widespread bleeding into the skin and from the mucous membranes.

In the ordinary angio-neurotic oedema there may be transient albuminuria, but nephritis is rare. In my third paper I called attention to the seriousness of nephritis as

a complication of the erythema group. Of the seven deaths in that series five were with uraemia. I have now additional cases to record. All of the cases had albumin with tube casts or blood. All but one of the cases with nephritis had purpura. No case had angio-neurotic oedema alone. Four had recurring attacks of polymorphic skin lesions. The cases fall into three groups.

1. Those which ran an acute course with dropsy, and death in uraemia within three months. Cases III and VIII of my published series²⁷ resembled ordinary severe nephritis with dropsy. Death occurred in both within twelve weeks of the onset. One was a child of 6, the other a child of 5, in whom nephritis came on in association with recurring purpura. In two other cases, Nos. XIX and XXVI²⁸ nephritis was a terminal event in a long series of skin and visceral manifestations, in one case in the seventh and in the other in the eighth month of the illness.

2. In a second group the albumin disappears and the patients get perfectly well. There were ten of such in the series. It may take several months before the albumin disappears. The general health may be excellent, while the urine shows a large amount of albumin and many tube casts.

Thirdly, in a fortunately small number of cases the nephritis becomes chronic. In the three reported here for the first time, albumin and casts have persisted for months. The danger is the gradual development of a progressive nephritis with the usual secondary cardio-vascular changes. I saw frequently with the late Dr. Prentice of Washington a boy who in his 13th year had three typical attacks of Henoch's purpura with acute nephritis. In the following year he had several terribly severe outbreaks, in one of which large haemorrhages into the skin sloughed. The boy was shown by Dr. Prentice at the Association of American Physicians with dropsy, albuminuria, retinitis, increased tension, stiff arteries, and hypertrophied heart.

The following cases, not yet reported, will give a general idea of the severer forms of nephritis.

Epistaxis; Pains in Hip and Swelling of Legs following a Wetting; Purpura; Recurrence of Attacks; Slight Fever; Haematuria; Much Albumin, Tube Casts; Angio-neurotic Oedema; Gradual Recovery; Persistence of Albumin in Large Amount Nine Months after Convalescence.

Harry C. (admitted to the Radcliffe Infirmary, under Dr. Mallam, February 2nd, 1912), aged about 20, with negative family history, and uniformly good health, except that for the last five or six years he has had frequent epistaxis. He got a wetting on Saturday, January 6th, 1912. On the 9th and two or three days subsequently he felt pain in the right hip; then he noticed that his legs began to swell at night, and three or four days later red spots came out on the skin of his legs. He was able to go on with his work, though he felt stiff and sore. He slept well and had a good appetite.

I saw him on Tuesday, February 6th. He then had an extensive purpuric rash on the skin of the legs—a fresh crop, he said—and there were signs of old spots. Both feet and ankles were slightly oedematous. The abdomen seemed normal. The backs of the hands were puffy and oedematous. The urine had a fair amount of albumin and a little blood, with numerous epithelial casts. He got better rapidly and sat up. In a few days he had another attack of purpura. On the 9th he complained for the first time of pain in the abdomen and vomited in the evening. He had slight fever, up to 100.5°. For a week he was better and the purpura faded. Then on the 18th he had sudden swelling of the right hand, which on the following day spread up the right arm to the elbow, and the left hand was also swollen. Every day there was slight abdominal pain. The temperature on February 18th was 101.2°; still albumin in the urine and a trace of blood.

On February 20th he had swelling of the right upper eyelid. He passed a small quantity of bright red blood from the bowel. On the 21st he had haematuria; on the 22nd he looked very ill. He vomited five or six times during the night, had a great deal of abdominal pain, the right eyelid was much swollen, the oedema was in spots petechial. Numerous granular casts and many blood corpuscles in the urine. On the 23rd a fresh crop of purpura appeared about the elbows and knees, and the vomiting persisted. For the next week he had at intervals paroxysms of severe abdominal pain. The

vomiting was better, the swelling of the eyelids disappeared, but he had successive crops of purpura about the wrists and ankles. Early in March he began to improve, the pains disappeared, and up to the 15th he had no reappearance of the purpura. The albumin was still present on his discharge, and he had lost 15½ lb.

October 21st, 1913. He came back for examination to-day. He looks perfectly well, has gained his normal weight, has a good colour, general examination negative. Apex beat is in normal situation, arteries are not sclerotic, urine still shows a large amount of albumin, and in the centrifugalized specimen many tube casts, chiefly hyaline, a few granular.

Severe Attack of Henoch's Purpura, with Necrosis, and Ulceration of Spots on the Legs; Nephritis; Many Slight Recurrences; Admission in a Sharp Attack, with Abdominal Pain and Haematuria; after Several Relapses, Discharged Cured, but with Much Albumin in the Urine.

Gladys B., aged 14, admitted under Dr. Brooks, June 23rd, 1913, with pains in the legs and purpuric eruption. She was in the Leicester Infirmary in the winter with a severe attack of Henoch's purpura, haematuria, with albuminuria and tube casts. There were extensive haemorrhagic lesions on the legs, many of which broke down, leaving ulcers which took a long time to heal. Since leaving the infirmary she has had several attacks of purpura fever. On admission she had no fever, but a purpuric eruption on the legs, which on the following day extended to the hands and arms; some of the spots were raised and urticarial. Urine: Specific gravity 1014, moderate amount of blood, much albumin, Esbach 0.3. On the 26th she had severe vomiting, no pain, but she brought up a little blood. During July she had recurring attacks of urticaria and purpura. Once she had bleeding from the gums and she has had several attacks of abdominal pain. The haematuria has been persistent. There was blood until the week of her discharge. The specific gravity of the urine was about 1015, the albumin was always very abundant, and there were a moderate number of hyaline and epithelial tube casts. She left the infirmary on October 1st very much better, having gained in weight.

I saw her again on October 14th. She looked well. general condition good. There was still a very large amount of albumin, curdy and thick, occupying the greater part of the test tube above the acid. There were a few hyaline and epithelial tube casts.

She was readmitted in November, another mild attack of purpura. There was no change in the urine.

Dr. Sturrock has allowed me to make a reference to the following remarkable case at present under his care:

On June 11th, I saw with him a lad, aged 9. A week previously he had a sudden swelling at the back of the right hand. That night he had an attack of colic. A few days later there was an eruption of purpura on the feet and legs and slightly on the arms. The temperature was 100–101°. For the first month colic was the troublesome symptom. The first crop of spots faded, and were succeeded by others of the same description. Urine was normal.

During July he had occasional attacks of colic, and spots at intervals. On the 20th he had another profuse outbreak, covering the arms and legs and abdomen, with several large confluent patches over the knees, arms, and shoulders, and some of the spots were raised and firm. He had had some vomiting, and had brought up some blood. Afterwards he had had blood and mucus in the stools. This morning he had a large bloody stool with clots. In the afternoon he began to vomit, and brought up much blood and mucus. In the absence of Dr. Sturrock I was called hurriedly about 3 o'clock, and his condition looked very serious. Purpura had extended. The spots were very thickly set on the abdomen and about the joints. The pulse was 140. He was very nauseated and looked collapsed. Dr. Gibson at once prepared fresh human blood serum, of which he had three injections of 10 c.cm. within twelve hours. Whether *post hoc* or *propter hoc* it is difficult to say, but he improved rapidly. He had no further vomiting, and for ten days steadily improved. Albumin appeared in the urine, but not in large amounts.

Towards the end of July haematuria appeared. The urine at times was bloody, at others smoky. There was a large amount of albumin and a few tube casts. During August the boy's condition was on the whole better, but the urine remained smoky with much albumin. About

the middle of the third week he had an attack of angio-neurotic oedema, involving first one side of the forehead, then the whole face, and lasting four or five days, without redness. He continued to have at intervals crops of spots.

About September 1st spots appeared on the backs of the hands, about the ankles and calves, of a different character—raised, infiltrated, haemorrhagic—from 3 to 6 mm. in extent, bright red in colour, and firm to the touch. Scattered among them were seven or eight hemispherical, yellowish-brown spots of a molluscoid character. On the back of the right leg were two pemphigoid blebs, with narrow red areolae, one of which was $1\frac{1}{2}$ cm. in diameter. Both were extraordinarily firm and solid. Scattered over the trunk were a few reddish raised papules, several of which were capped with small blebs. The urine has increased in amounts of 60, 70, 80 oz. in the day, and almost every specimen is smoky; sometimes there is a bright red sample. I examined on September 15th two samples, evening and morning. The amount of albumin in both was large and thick and curdy. Specific gravity in the morning 1004, in the evening 1012. Many blood corpuscles; both samples were centrifugalized, and in a large number of slides there were only a few hyaline casts.

In October and November the skin lesions were better, but he lost in weight, and there has been no change in the urine. Occasionally in the morning it was free from blood, but as a rule it was smoky and contained much albumin, but only occasionally a tube cast. On October 20th, on the left arm, there appeared one of those curious solid blebs about the size of a large pea, quite firm, hemispherical in shape, and the skin about it not reddened but infiltrated, and solid to the touch. During December he was on the whole better, and passed from 60 to 70 oz. of urine. There has been only occasionally spots, sometimes petechiae; sometimes solid, raised, red papules about the elbows and knees. The tongue cleaned. The worst feature is the recurrence, at intervals of from a week to ten days, of attacks of vomiting, with which, as a rule, the amount of urine diminishes; the temperature above 100, sometimes 101; and during these attacks there is an occasional tinge of blood in the urine. As a rule the specific gravity is very low—1004, 1006—the amount of albumin very large, tube casts scanty.

The anatomical lesions of this type of nephritis with purpura have not been much studied. I have not had a *post-mortem* examination on any one of my fatal cases. Through the kindness of Dr. W. T. Watson²⁹ and Dr. W. A. MacCallum I saw the kidneys of a typical case in which death occurred with dropsy at the end of the sixth week from the outbreak of purpura. There was no endocarditis, the spleen was greatly enlarged, the kidneys were enormous, each measuring 12 by 7 cm.; the cortices were pale, the striations distinct, and the glomeruli stood out as translucent nodules like milium tubercles; there were a few small haemorrhages. In addition to the extensive degeneration of the epithelium, the tubules were filled with desquamated cells, hyaline casts, and red blood corpuscles. The glomeruli showed remarkable changes. Every tuft was much compressed within by a new growth of the capsular sheath, forming a crescentic mass. Dr. MacCallum tells me that this is a type described as adhesive glomerulo-nephritis, in which, with great proliferation of the epithelium, there is also a new growth of connective tissue within the capsules.

Clinically, there are several features of great interest in this type of nephritis. Long after all signs of cutaneous symptoms have disappeared haematuria may persist for months, just enough, perhaps, to tinge the urine.

Secondly, the albumin is unusually abundant, thick and curdy. Thirdly, with large amounts of blood and albumin, tube casts may be absent and scanty. Fourthly, dropsy may be absent, even when the nephritis has persisted for months, as in the three cases at present under observation. And lastly, for months after the patient has recovered his usual health, albumin may persist in the urine in large amount.

The diagnosis of the nephritis associated with the skin rashes of the erythema group is as a rule easy, only it must be borne in mind that oedema may not be present, and that the nephritis may persist long after the cutaneous symptoms have disappeared.

The combination of nephritis with a skin rash in which the erythema predominates may lead to the diagnosis of

scarlet fever. On June 25th, 1894, I saw in the examining room of the Johns Hopkins Hospital, with Dr. Hewettson, a man aged 23. Three months before he had a skin rash, said to be scarlet fever associated with arthritis, urticaria, and general anasarca. These symptoms gradually disappeared, and he got quite well. Three weeks ago he began again to have pains and swellings in the knees, wrists, and ankles, and purple blotches have occurred in crops on the skin of the legs. The patient was a healthy, well-nourished man, not anaemic, and it was hard to credit that he had had anasarca three months ago. From the groins to the ankles the skin of the legs was covered with urticaria and purpura; there were none on the feet; the urine was not albuminous. He thought—and I was inclined to agree—that the rash at the onset was of much the same character, but more extensive, as that which now exists.

It is also to be remembered that purpura is a by no means uncommon complication of chronic interstitial nephritis. I have notes on a number of cases of this type, and my experience bears out that of Stephen Mackenzie as to the great frequency of this complication. One is, however, sometimes deceived, as in the young chronic interstitial nephritis is consistent with excellent health, and the patient may be admitted with the features of ordinary Henoch's purpura. This happened in the following case.

Jessie S., aged 13, was admitted to the Radcliffe Infirmary, under Dr. Collier, on December 13th, 1911, complaining of pain in the stomach and headache. She has had nocturnal enuresis for five years, and lately she has begun to have vomiting. She looks fairly healthy; the tongue is clean, the teeth are good, there is nothing in the throat, nothing in examination of the chest and abdomen. The urine was 1012, acid, 0.35 per cent. albumin with Esbach, and microscopically a few hyaline and granular casts. She is deaf, and complains of a little pain in the right ear. She has no fever. For the first ten days she was in a curious state, very drowsy, and had vomiting at intervals; then about the 20th the vomiting became more constant (five or six times a day), and the amount of albumin increased. The urine was acid; specific gravity about 1010. She has had a slight attack of abdominal pain. On the 19th and 20th she had severe bleeding from the nose on both sides, and the nostrils had to be plugged. On the 21st there was a raised papular rash on the arms, chiefly the extensor surfaces; in places diffuse erythema, in others small raised red spots. On the abdomen there was an extensive outbreak of purpura; on the anterior surfaces of the thighs a number of larger raised haemorrhagic spots; none on the legs. The urine during the past few days has become turbid and contains numerous streptococci, which have been cultivated. The patient has become very thin, is very restless at night, much disturbed by the vomiting. Albumin ranges from 0.2 to 0.35 per cent.; specific gravity 1010 to 1012. There was no fever; there were no retinal changes, and there was nothing suggestive in the cardio-vascular state. On January 25th there was a fresh outbreak of spots, many of them raised and abundant on the face and forehead. Over the arms the combination of erythema and mottling suggested measles. On the 26th the child had severe abdominal pain and was very drowsy; the urine contained a large amount of albumin, was a little turbid, and had numerous streptococci. She complained of pain in the right side of the face, and gradually the parotid became swollen. The amount of albumin increased; the child grew rapidly worse, became very drowsy, and died on January 28th. *Post-mortem* examination showed (to our surprise) only a fragment of the left kidney, and the right kidney in a state of extreme interstitial nephritis. The left parotid was suppurating.

Manifestly this was a case of latent interstitial nephritis with uraemic symptoms, shown by the vomiting and the drowsiness, in which we were deceived by a combination of abdominal pains and purpura.

Cardiac Complications.

Heart murmurs are common and usually of little significance in debilitated or anaemic children. Endocarditis may be a complication of the infectious purpuras, rheumatic or septic. In what Cheadle used to call the rheumatic cycle the skin lesions and endocarditis may coincide, as in the child already referred to, with outbreaks of purpura and

chorea in the third year, and in the fifth a severe attack of urticaria, during which endocarditis was discovered. It occasionally occurs in very severe cases of what is called purpura rheumatica, but it must be rare. The complication was not present in the long series of cases on which Platt based his article. I saw with Dr. Musser a boy with arthritis, purpura, and fever, in whom under observation a loud mitral murmur occurred, which persisted after convalescence. In the septic forms of purpura associated with gonorrhoea, puerperal fever, or a local skin lesion endocarditis is more common and is usually latent.

Respiratory Complications.

In the various forms of purpura respiratory symptoms are not common, but there have been in my series several cases with very remarkable and serious features. In No. II, a boy, aged 10, had for five years an extraordinary sequence of skin lesions, purpura, urticaria, oedema, and erythema. In several attacks he had a bronchial wheezing; then asthma and emphysema came on, and he died in an acute attack of pneumonia with pericarditis. In No. XXVI, a girl, aged 24, with recurring attacks of erythema and purpura, had severe pneumonia during an outbreak. Five months later she died of acute nephritis. No. XI, a child, died of pneumonia a month after an attack of purpura.

The association of asthma and urticaria is an old story. In a case of whooping-cough in an adult asthma persisted for more than eighteen months, and the attacks were associated with intolerable itching between the shoulders and very often an outbreak of urticaria in this region.

Very serious respiratory complications occur in angioneurotic oedema. Dyspnoea may follow great swelling of the neck externally, or, as in a girl from California, seen with Dr. Hale White, the swelling of the tongue and the fauces may be sufficient to obstruct breathing.

The chief danger is oedema of the glottis. Two members of the New Jersey family I have reported died from this cause; both father and daughter as reported by Griffith,³⁰ and a man aged 21 had tracheotomy performed twice, and in a third attack died before assistance could be reached.³¹ The oedema may be in the trachea, as in the extraordinary case reported by Rudolf.³² A woman aged 63 began to have attacks of erythema and oedema affecting, in the course of three years, lips, nose, ears, legs, and face, usually transient. Twice the mucous membrane of the trachea became swollen, causing great stridor; the second attack proved fatal.

Among other complications may be mentioned the frequency with which the spleen is enlarged; the liver, too, may be swollen. In one case a woman aged 50 was admitted with purpura, abdominal pain, and a temperature of 104°. The pain was high in the region of the gall bladder, and was probably due to gall stones, as jaundice appeared on the following day.

Parotitis is not uncommon in the acute infections with which purpura is associated, such as malignant endocarditis and pneumonia. In such a case as that described under renal symptoms, in which the purpura was a terminal event in a chronic interstitial nephritis, the accompanying parotitis was of the same nature; sepsis was present. But in the following case, under the care of Dr. C. J. Wood, the parotitis occurred in one of these remarkable instances of acute febrile erythema with purpura, in which the patient had half a dozen relapses of great severity.

J. C., aged 22, a medical student with good family history, was strong and well until the present illness. On November 1st he had a chill, with headache, vomiting, and the temperature rose to 105°. On the second day an eruption appeared all over the body, purplish-red in colour, which lasted for two days. The temperature persisted, with much fever and headache; on the fifth day the right parotid gland became swollen and tender. The symptoms gradually disappeared, and the parotid subsided, and at the end of ten days he was quite well. As mumps were about, it was thought possible to be an anomalous case. He went back to his studies for three days; then with chilliness and headache a second attack came on; the temperature rose to 105°, and on the second day a rash appeared—raised spots, 1 cm. in diameter, some looking like ordinary hives, others of a deep purple colour. With this attack there was nausea and vomiting, but no abdominal pain. At the end of

three days he felt quite well. He had in all six or eight of these attacks. In one there was an outbreak of ordinary purpura on the hands and feet. In the third and fourth attacks the knees, ankles, and shoulders were slightly swollen and tender; the superficial lymph glands became enlarged, but not the spleen. In one attack there was a slight conjunctival haemorrhage; the bowels were constipated, but considering the severity of the attacks the general health was not much disturbed. There was no anaemia; there was always a slight leucocytosis. The attacks gradually wore away and the young man recovered.

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ORAL SEPSIS SIMULATING HENOC'S PURPURA.

By T. S. BRADBURN, M.R.C.S., D.P.H.

A GROOM, aged 28, was first seen by me on February 3rd, 1913. His previous health had been always good, and his family history was good also.

At the end of an ordinary day's work in the stable, just before Christmas, 1912, he was suddenly seized by a shivering fit, had pains in all his joints, and a general feeling of malaise. He passed a restless night, and the next morning noticed that his legs were covered with blotches. He stayed in bed for a fortnight and got a little better; but, on getting up at the end of this time, he caught, in his own words, another cold, and the joint pains, which had never quite gone, returned with increased severity, and he again broke out in blotches over the legs and lower part of the stomach. In addition, he now had pains in the abdomen, severe, spasmodic, not related to food, and, while intermittent, never absent for many minutes. He remained in this condition up to the date when I first saw him—approximately six weeks from the commencement of his illness.

He was a well-developed, muscular man, rather flushed, and looking ill. He was quite rational and answered intelligently, but every few minutes he would roll about in bed groaning from abdominal pain.

His pulse was 90, large, soft, and regular; the temperature was 99.2° F., and he was sweating slightly; the tongue was clean. There were no physical signs in the chest; the abdomen was slightly distended uniformly, but nowhere tender, and he suffered deep palpation all over without flinching. Pain was not elicited in the right iliac fossa, and there was no superficial skin tenderness anywhere. There was no visible peristalsis and no sign of fluid. The bowels had moved that morning. There was neither swelling nor tenderness of any of the joints. Over the lower part of the abdomen, on the thighs, legs, and small of the back were scattered purpuric spots, not raised, not fading on pressure, and varying in colour from brown to red.

I was quite at a loss for a diagnosis, and as the man was evidently in great pain, chiefly abdominal, I advised that he should be taken at once to the hospital. He was admitted accordingly to the Wolverhampton General Hospital under Dr. Malet, to whom I am indebted for permission to publish the case. To Dr. Rattrie, the resident medical officer, I am under much obligation for the use of the notes he took while the patient was under his care.