It is unlikely that undamaged renal tissue would allow such an important plasma constituent to escape and be lost in the urine. Parsons³ considers "febrile albuminuria" indicative of the mildest form of renal inflammation—a form in which clinically there is no oedema, but which shows changes in the tubule cells on morbid anatomical examination.

A comparison between the urinary findings and the morbid anatomical findings may be seen in the following table:

	Urinary Findings.	Necropsies.
Nephritis		7.1%
Albumin +, casts +, blood + ...	4.5%	
Cloudy swelling		40.5%
Albumin +, casts -, blood - ...	48.0%	
Normal		47.6%
Albumin -, deposit -	47.5%	

This table shows a comparison between renal and urinary findings in two series of cases. The number of cases showing normal findings at necropsy and normal urine findings is practically the same. Similarly, the acute nephritis figures closely approximate. The remaining large group, in which albumin, in variable degree, is the only abnormal feature in the urine, agrees closely with the number showing simple cloudy swelling ("parenchymatous degeneration" of MacCallum). The significance of this change in the cells is regarded as one of the earliest indications of a disintegrative effect. There seems no doubt, however, that such cells can resume a normal anatomical and physiological state. Authorities state that acute nephritis may occur at any stage of the disease in acute lobar pneumonia. In four cases occurring in the present series the condition was detected on the fourth, fifth, sixth, and eleventh days of the illness. In each case a simple albuminuria appeared before the presence of casts and blood cells. No relation to the length of the febrile period or other single clinical feature was found. In each instance the abnormal urinary findings only lasted for a maximum period of one week, and quick recovery appeared to be the rule. In the convalescent stage each patient conformed to the normal in response to renal function tests. Pneumococcal infection would appear to act adversely on kidneys which have suffered from a previous attack of nephritis, but even in these instances the exacerbation is probably only a temporary matter, and return to a satisfactory condition may be anticipated in most cases.

Investigation of 102 cases of pneumococcal disease other than lobar pneumonia showed:

Normal	46 = 45%
Albuminuria alone	45 = 44%
Albumin, casts, and blood cells ...	11 = 10%

Morbid anatomical findings in a similar series (65 cases) showed:

Normal	25 = 38.5%
Cloudy swelling of parenchyma ...	31 = 47.0%
Pyæmic abscess	1
Nephritic changes	8 = 10%

Comparison of these results with those obtained in cases of pure lobar pneumonia shows that the readings are similar. No greater incidence of renal involvement is indicated; the degree and duration are apparently the same, and an early recovery of any renal lesion also occurs. It would also appear, therefore, that the particular focus or even extent of pneumococcal infection bears no relation to any consequent renal damage.

A remarkable constancy in the low incidence and the benign clinical features, *qua* renal symptoms and signs, was observed. In no case were any detectable cedema or uraemic symptoms found. Twenty-one cases of clinically pneumococcal infection in children under 7 years of age showed:

Normal	5 = 23.7%
Simple albuminuria	12 = 57.2%
Albuminuria with casts and blood cells ...	4 = 19.0%

This small series suggests that a somewhat higher incidence of renal involvement occurs in the young patient. Clinically, however, as in the adult, a minority of signs occur and quick recovery is usual.

On clinical grounds the pneumococcus would appear to be a benign organism in relation to the etiology of nephritis. Immediate and ultimate prognosis of renal damage in infections due to Fraenkel's organism would appear to warrant optimism. That profound toxæmia occurs in many cases of pneumococcal disease is not doubted, but the views here suggested are in accordance with a low renal susceptibility thereto.

Conclusions.

1. In acute lobar pneumonia nephritis is uncommon, but mild recoverable degenerative changes in the renal parenchyma are not uncommon.
2. Nephritis occurring in lobar pneumonia is of a mild type, of short duration, and apparently recovery is the rule.
3. Similar conditions occur in other pneumococcal infections.
4. The benign features of renal involvement in pneumococcal infection are similar in children and adults.

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EXTREME EMPHYSEMA INVOLVING THE GREATER PART OF THE BODY:

REPORT OF TWO CASES.

BY

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WHILE surgical emphysema is fairly often met with in connexion with fracture of the ribs, it is, so far as my experience goes, generally fairly localized in a small area surrounding the site of injury. The only case seen by me which was comparable in extent and severity to those now reported occurred in Sir William Macewen's wards in the Western Infirmary, where, in addition to the chest, the head and neck were involved, and the emphysema extended down over the abdomen to the scrotum, which was greatly distended, resembling a large hydrocele.

The cases now reported occurred at about two months' interval, the second being admitted before the first was dismissed. Both men were critically ill on admission and for a considerable period thereafter, rendering thorough examination, even by x rays, impossible.

The first, a miner, aged 44, was crushed by a fall of stone in the pit, and complained of great pain on the right side of the chest on admission, and inability to move the right arm, probably due to fracture of the right clavicle, with injury to the brachial plexus. He had a curious audible crepitus on respiration, which appeared to originate over the sternum. Emphysema had already appeared over the right chest, and on applying strapping the emphysema spread rapidly over the right neck and face, the eye being completely closed. Soon the whole face, neck, chest, and abdomen were involved, the tissues becoming greatly distended, and the skin tense and glossy. The patient was quite unrecognizable. The scrotum was ballooned up. He had great difficulty and pain in breathing; the pulse was good, but the temperature was subnormal. In spite of incisions made to allow of escape of the air, the emphysema extended, and next day the arms, and the legs down to the ankles, had become involved. Breathing was now laborious, and the patient was cyanosed; the temperature was elevated and the pulse rapid and soft.

After some days the emphysema began to subside very gradually, so that, three weeks later, it was very markedly less, the face now being free, although the thighs were still affected.

Although in this case fracture of the ribs was diagnosed clinically from the emphysema over them and the curious crepitant sound, no evidence thereof was found on x-ray examination, the fracture of the clavicle being the only definite x-ray finding.

The second case, a man of 47, a forester, fell from a tree, and was admitted in a collapsed condition, with an obvious fracture of the right humerus about the insertion of the deltoid, a dislocation of the same shoulder, which was entirely masked by the emphysema which had already occurred, extending from the fourth rib (which was fractured, together with the second and third ribs), to the angle of the jaw, and over the shoulder. A crepitant sound was also heard in this case, appearing to arise from the sternal region. About three hours after admission the

breathing was considerably embarrassed and the patient complained of great tightness in the chest and of severe headache. The emphysema had now greatly extended, involving both sides of the face (distending the eyelids, so that the patient could not see), both sides of the neck and thorax, the skin being tense over these regions, and, to a lesser degree, the abdomen. The scrotum was moderately distended. There was a slight degree of emphysema in the left thigh.

During the night the patient was very ill. He was delirious, with a temperature between 102° and 103° F.; the pulse was rapid

and soft, respirations short and jerky, and cyanosis marked. The emphysema now was at its maximum, involving the whole body except the scalp, the skin being tense and glistening over a large area of the face, neck, and chest. It extended to the feet, but was not marked below the knees. On squeezing the air out of the eyelids, and forcing them open, the conjunctiva was found to be affected; the accompanying photograph was taken after it had somewhat

subsided. At this time the crackling sound on respiration was audible at a distance. While the patient remained very ill for three weeks, being generally delirious at night, the emphysema gradually subsided, but persisted over the chest and neck for about four weeks.

Both patients made a satisfactory recovery, leaving the hospital about a couple of months subsequent to admission. The first patient still suffers from the effects of injury to the brachial plexus, and the second had considerable trouble owing to the double condition of fracture and dislocation complicating his otherwise serious condition.

The notes on these cases are abstracted from the reports made by my house-surgeon, Dr. E. Fischbacher, and the photograph was taken by one of my senior students, Mr. R. Brown.

AVULSION OF THE SCALP.

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AVULSION of the scalp is probably a much less common accident than formerly, owing to the better fencing of machinery and the modern fashion of wearing the hair short. In the three years 1924-26, however, the number of cases of partial or complete avulsion was 19.¹ It is more common in women than in men—for example, 6 out of 9 cases at the Massachusetts General Hospital, quoted by Davis.² The avulsion is very often complete, the integument being torn at its thinnest part—the level of the brow, and the line of separation passing between the loose areolar tissue underlying the epicranial aponeurosis and the pericranium. Death may take place from haemorrhage and shock.

Judging from the literature on the subject, the end-results of treatment are none too good, while convalescence is tedious and not without danger from septic infection. The chief obstacles to successful treatment are the difficulty of obtaining an adequate blood supply for the new skin and the liability to sepsis.

"Even the slightest pressure causes exfoliation of the skin, microbic infection below the crusts occurring in all the grafts."³ Abbé records a case in which 12,000 grafts were planted in four years.⁴

"In a few cases, when done shortly after the accident and in the absence of sepsis, whole-skin Wolfe grafts seem to have given sound end-results—that is, movable, sensitive skin, with no tendency to break down."⁵ In others a combination of these and Thiersch grafts have been successfully used.⁶

Porter and Shedden⁷ record a case where healing was obtained by removing several circles of bone from the calvarium to secure a dural blood supply.

Davison⁸ drilled fifty holes in a case where the pericranium had sloughed.

All these methods are illustrated in the following case, but final healing was only achieved by making use of a tube graft after the Tagliacotian method. My only regret is that I did not think of it earlier.

The method of Porter and Shedden (which dates back to Indian scalplings) is perhaps not without risk of meningeal infection, and is contraindicated in young people owing to the active regeneration of bone. Replacement of the avulsed scalp is to be avoided owing to the danger of sepsis.

A girl, aged 15, had her scalp avulsed in a machinery accident in September, 1920, leaving only a narrow strip on each side and below the occipital protuberance. The bare area was extensively Thiersch-grafted, but the higher grafts did not take well, and the new skin showed a pronounced tendency to disintegrate. Large or smaller areas kept breaking down and ulcerating in spite of the most careful treatment and protection. Further Thiersch-grafting was done on several occasions during the next two and a half years, but sound healing was never achieved.

The regions where disintegration most frequently occurred were carefully noted, and in January, 1924, after due preparation of the head, I removed eight circles of bone from half to three-quarters of an inch in diameter, and situated below these patches. The cavities were lightly packed with eusol gauze; granulations soon reached the surface and the epithelium grew over. Convalescence was afebrile, and free from any complication whatsoever. For a time healing seemed to have been secured, but after some months the same disintegrative processes recurred—no doubt owing to the dural blood supply being cut off by newly formed bone.

A year later several ulcers of various sizes were present in or near the old sites; Thiersch and Wolfe grafts were tried, but without permanent success, and consolidation seemed as far off as ever. The skin was mobile for about an inch at the sides and over the rest of the skull adherent to bone.

Stage 1.—On February 10th, 1926, a tubular skin graft 11 in. by 4½ in. with two pedicles was raised from the abdominal wall, extending from just above the pubis well into the right flank and passing below the umbilicus.

FIG. 1.—Stage 2.

FIG. 2.—Stage 3.

FIG. 3.—Final stage.

Stage 2.—Four weeks later the upper end of the graft was mobilized and attached along its free edge to the back of the right forearm, below the radio-ulnar joint, the abdominal wound, which had been approximated by extensive undercutting, being nearly healed. As her general condition was not very good, she was sent to a convalescent home for some weeks, and did not find the position of the arm irksome during this time.

Stage 3.—On May 20th the graft was detached from the abdomen and sutured to the edge of the scalp on the right side of the head. Contrary to expectations, no great difficulty was experienced in keeping her comfortable, nor in securing aseptis.

Stage 4.—Seventeen days later the arm was freed and the opened graft sutured to the edge of the scalp on the left side. The bed was prepared by excising a corresponding area of the old skin, a small oblong piece at each end—where it was mobile and the blood supply apparently adequate—being retained on a single