and vessels in the great, and also in the gastro-splenic, omentum. Stomach, suprarenals, pancreas, kidneys, and upper intestine appear fairly normal on macroscopic examination. Lower intestine: Acute congestion of the ileum. No ulcers. No swelling of Peyer's patches. Acute congestion of ileum opening into the caecum. Some little congestion of the ascending colon. Transverse, descending, and pelvic colon normal. Lungs: Left—broncho-pneumonia of both lobes, the lower more marked. Right—lower lobe consolidated, marked broncho-pneumonia; upper lobe partly consolidated and in same condition. Culture from gall-bladder contents grew a pure growth of *Bacillus paratyphosus* B. Widal; serum agglutinates *B. paratyphosus* B in dilution of 1 in 2,500; *B. typhosus*, nil.

Microscopical Sections.—Lungs: Marked broncho-pneumonia; all the blood vessels are congested, many of the alveoli are filled with red blood corpuscles, and there is a good deal of blood pigment; other alveoli are filled with catarrhal cells and leucocytes, which appear to be chiefly mononuclear. The lumen of one of the smaller bronchi is filled with a catarrhal exudate. The vessels in the wall of this bronchus are congested and the connective tissue is very cellular, showing marked proliferation of the fixed tissue cells. Gram-positive cocci could be demonstrated in the exudate, but no Gram-negative bacilli. Spleen: The lymphoid follicles are smaller than normal, but are very cellular. They give the impression that there has been active proliferation followed by exhaustion. The spleen pulp is congested and cellular. Kidneys: The vessels are congested; the glomeruli are swollen and cellular; and there is some degeneration of the epithelium of the convoluted tubules.

It will be noted that in this case the post-mortem examination by itself would not have led to the true cause of death—namely, paratyphoid fever. The serum was markedly positive, and a pure growth of *B. paratyphosus* B was obtained from the contents of the gall-bladder.

CASE II

Samuel, aged 13, was admitted on February 11th and died on February 20th, 1931. On admission he was thin and dehydrated. Tongue furred; throat was slightly injected, but clean. Abdomen: Nothing abnormal. Heart sounds were normal, but weak. Lungs: No adventitious sounds. Faint, brownish, lenticular spots were present over the abdomen and legs. The patient appeared extremely ill and toxic. He was delirious and at times restless. Pulse was dicrotic, colour was very poor, and eyes were sunken.

Course of Disease.—Swinging temperature, with marked remissions (from 99° to 104.8°). Low muttering delirium, with intervals of great restlessness. The rash faded about February 16th; later, definite *subsultus tendinum* and carphology were present. There was some degree of cough. On February 20th, at 10 a.m., there was a very profuse epistaxis, and petechial haemorrhages were present over the chest, abdomen, and back, but not on the face, arms, or legs. Over the pressure points (sacrum, trochanters, and back of the chest) the punctate haemorrhages amounted to definite ecchymoses. The general colour of the affected area was a fairly bright scarlet. Condition of the patient became rapidly worse—typhoid facies, delirium, running pulse, etc.—and death occurred suddenly at 4.20 p.m.

Post-mortem Examination

A very emaciated subject. Petechial haemorrhages general over the chest, abdomen, and back; over the pressure points (sacrum, great trochanters, etc.) there were definite purpuric patches, some as large as a five-shilling piece. Lungs: Early broncho-pneumonia; haemorrhages present in the lung substance. Abdominal viscera: No peritonitis. Definite congestion of the lower eighteen inches of the ileum. In the caecum, and round about the base of the appendix, a fairly large ulcer was seen with intense injection around. Smaller ulcers were present in the ascending colon (size varied from a shilling to a five-shilling piece).

Sections (report by Dr. Mair).—Intestine: Section of ulcer at lower end of ileum; the mucosa shows marked inflammatory change as indicated by proliferation of connective tissue cells and infiltration with lymphocytes; over two areas in the section the epithelium has completely disappeared. Section of

ileo-caecal valve: The mucosa shows similar changes; over a considerable area the epithelium has almost completely disappeared. Spleen: The lymphoid follicles are ill defined, and there is an increase in the number of lymphocytes in the sinuses. Kidneys: The glomeruli are swollen and cellular, with congested vessels; some of the convoluted tubules show cloudy swelling, and necrosis of the epithelium. Liver: The portal tracts show an increase in the number of the lymphocytes present, and in the centre of the lobules there is some atrophy of the liver cells. Lungs: The smaller bronchioles are filled with polymorphonuclear and catarrhal cells; the vessels are everywhere engorged with blood; there are areas with haemorrhages into the alveoli; and some alveoli also contain catarrhal cells and polymorphs. Numerous Gram-positive diplococci and streptococci are seen. No Gram-negative bacilli were found. The condition is one of early broncho-pneumonia.

COMMENTARY

Eruption of purpuric rashes in the typhoid group is considered very rare. The late occurrence of such rashes is referred to by Dr. E. W. Goodall. The differential diagnosis of this condition from the purpuras is simplified by the history, the high Widal, the facies, the extreme degree of toxicity, and, finally, by the fact that the blood platelets were present in the usual numbers.

The blood reactions and examination of stools and urine were carried out at the Northern Group Laboratory, North-Eastern Hospital. My thanks are due to Dr. Pereira, the medical superintendent, and to Dr. Mair, for their kind help and permission to publish these cases.

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CONTACT GLASS OR CROSSED CYLINDERS FOR HIGH ASTIGMATISM

BY

J. H. BEAUMONT, M.B., CH.B. NEW ZEALAND,
D.O.M.S.

SENIOR CLINICAL ASSISTANT AND REFRACTIONIST, ROYAL WESTMINSTER
OPHTHALMIC HOSPITAL; OUT-PATIENT OFFICER, ROYAL
LONDON OPHTHALMIC HOSPITAL

Contact glasses are glass shells worn on the eyeball to replace an irregularly refracting surface of the cornea by the regular curve of the glass. They are not so uncomfortable as one might imagine. They are applied by the surgeon using a rubber sucker attached to the glass shell, the concavity of which contains saline or Locke's fluid. Holocaine 2 per cent. may be used as a local anaesthetic. The patient's head is bent forward, the eyelids separated, and the contact glass is fitted on to the eyeball, care being taken to avoid air bubbles. Contact glasses have a scleral curve, and also a corneal curve of shorter radius, so that the glass is in contact with the sclera but is separated from the cornea by a layer of saline. At first they should be worn only for about an hour a day. Enthusiastic patients soon learn to fit them on themselves. Professor Heine of Kiel uses the contact glass grounded by Zeiss. In Vienna they say that for some cases the older contact glasses blown by Müller are better tolerated, as they do not fit so tightly. Contact glasses should not be worn at night, because when the eyes turn up during sleep the cornea may become abraded. They are practically invisible, and do not interfere with movements of the eyes.

These glasses may be used for cases of conical cornea, irregular corneal opacities, high astigmatism, high myopia,

and high hypermetropia, and in cataract cases after operation. They are of great value in certain corneal conditions in enabling the patient to have useful vision. But they may also be employed for any refractive error, and there are possibilities for contact glasses even in the realm of sport. I know of a Canadian who wears them while flying in an aeroplane. They may even be worn in place of ordinary glasses by actresses or people not wishing to wear spectacles. It has been claimed that their temporary application has been followed by permanent loss of small degrees of astigmatism. They have also been suggested in cases of muscle imbalance, and in other cases where difficulty is experienced with ordinary glasses.

They cost about £5 each wholesale. In Vienna I saw six hospital patients wearing them with satisfaction. They were prescribed even in cases of chronic ulceration of the cornea which had just healed. Instead of irritating the cornea, as one would have expected, they actually protected it from recurrence of ulceration.

CROSSED CYLINDERS

The crossed cylinders to which I am referring are two cylindrical lenses at right angles instead of the ordinary combination of sphere and cylinder. If a +8 D. cylinder at 90 degrees is combined with a -8 D. cylinder at 180 degrees the effect is that of a +16 D. cylinder at 90 degrees combined with a -8 sphere. In the following case the ordinary sphere and cylinder combination could only bring the vision from counting fingers to 6/36, while the crossed cylinders brought the vision to 6/6; this indicates the possibilities of this method. While admitting the improvement, I would condemn their continuous wear, as they cause so much distortion, except in a very limited

central field. On the other hand, they may be of great assistance in investigating other cases.

History of Case

L. T., male, aged 42, salesman. This man was injured in a molten metal accident in 1912. Owing to failing sight he had to give up his work ten years ago. The right eye showed extensive lens changes with much thickening of the anterior lens capsule, but the cataract was not mature. The vision of the right eye was 6/18 (not improved with lenses) and J. 12 with difficulty. The left eye had a corneal opacity covering the nasal half of the pupil. There was pseudo-pterygium with two strands of adhesion of the conjunc-tion of the lower lid to the globe. The high astigmatism had evidently been caused by the contraction of scar tissue. His

left vision was reduced to counting fingers, and was not improved by a mydriatic. The retinoscopy of the left eye was:

+9
+ -9,

and with two crossed cylinders +8 D. cylinder at 10 and -10.5 D. cylinder at 100 the left vision was brought up to 6/9 and J. 1. But owing to distortion he was unable to recognize me with this correction at the other end of the room. With a contact glass, 9 mm. corneal curve and 12 mm. scleral curve, he read 6/6 and J. 1, with a 7 D. sphere. All his astigmatism had disappeared, and he had much more useful vision.

I am indebted to Sir Richard Cruise for his permission to publish this case.

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Memoranda

MEDICAL, SURGICAL, OBSTETRICAL

INTERLOBAR EMPYEMA

Empyema between the middle and lower lobes on the right side is not very common.

The patient in this case was a woman of 40, admitted to hospital. She had, a month before, begun a pneumonia which involved the whole of the right lung and the base of the left. Her temperature, which was 103° F. at first, had come slowly down to 100°, but was never below that at night, and occasionally was higher. She looked very ill. There was an enlarged vein on the right side of the abdomen. The liver could be felt two fingerbreadths below the costal margin.

The right side of the chest moved very little. Resonance was diminished at the apex, and was less every interspace. From the fourth rib down there was complete dullness. Breath sounds were bronchial over the right upper lobe, bronchial with fine crepitations from the second to the fourth space, bronchial and less loud, with no crepitations, in the fifth and sixth spaces, weak, with a few crepitations, below that. Vocal resonance was increased in the third and fourth spaces, but absent below the fifth rib. The right back was

dull from the spine of the scapula downwards. Fine crepitations and weak bronchial breathing could be heard from the spine of the scapula right down to the base. In the left chest there was rather puerile breathing, and some crepitations for three inches at the base. The heart's apex was only about half an inch outside normal.

I had a needle put into the fifth space about an inch outside the nipple line in the area where there was still fairly loud bronchial breathing, but vocal resonance had gone. Thick pus was withdrawn. At the operation next day quite a pint of pus was found between the middle and lower lobes of the lung.

Previous cases of this interlobar empyema that I have diagnosed have had very similar physical signs—a compressed middle lobe, with bronchial breathing, fine crepitations, and increased vocal resonance. In the fifth and sixth spaces external to the nipple line, where the empyema is nearest to the surface, and where the needle will strike pus, there is still quite loud bronchial breathing, but an absence of vocal resonance. At the back of the lung, crepitations can be heard down to the base. A rather deceptive point is that the heart is very little displaced, if at all, to the left, though the same amount of pus free in the pleura would displace it considerably. If undiagnosed this empyema may, with luck, open into the general pleural cavity, but more often it bursts into

Zeiss's contact glasses.

Müller's contact glasses. They have no corneo-scleral shoulder, and are blown by handiwork