I believe it will be found of use in a much larger and more important class of cases. In July, 1908, Dr. Alexander Morison published a very important paper,² based on a case of his, in which the operation was done mainly to relieve anginoid pain in a boy suffering from aortic regurgitation; $4\frac{1}{2}$ in. of the fifth rib and $5\frac{1}{2}$ in. of the sixth rib were removed. The boy bore the operation well, and six weeks afterwards the anginoid attacks were much lessened, and the patient felt altogether stronger and better than before.

Dr. Morison advocates cardiolysis on two grounds—(1) To relieve intrathoracic pressure, both when the mere bulk of the heart was the chief feature in the case, and when, as in irremovable mediastinal tumour, the heart was secondarily involved in the neoplastic growth; and (2) to prevent undue stimulation of the heart. He says the brunt of the heart's beat is normally expended against a soft interspace. When, however, the heart is increased in size, its apex thrusts against one or more ribs, which are hard and unyielding. He holds that this blow may develop a morbid excitation of the heart, which may cause increased systolic pressure associated with discomfort or pain. "It is reasonable to suppose, therefore," he writes, "that providing the enlarged and powerfully pulsating heart with a proportionately large interspace void of osseous resistance might prove a means of sparing its energy."

While I recognize that Dr. Morison's paper constitutes a great advance in our views as to the indications for cardiolysis, I think it does not place them quite on the correct basis. Let me develop my own views in connexion with a case at present under my care.

A girl aged 12 years suffered a year ago from an attack of chorea; otherwise she was never ill. In connexion with the chorea she appears to have had acute mitral endocarditis, for she has now come into hospital suffering from great breathlessness and from discomfort and some pain about her heart. There is no dropsy or signs of congestion of the lungs, liver, or kidneys, but the child is incapable of any exertion and looks very wretched and ill; compensation has evidently broken down. On examining her we find, in addition to a mitral systolic murmur, signs of considerable hypertrophy both of the left and right ventricles; the apex beat is in the fifth space, $3\frac{1}{2}$ in. from the middle line and very forcible, and the third, fourth, and fifth ribs and the lower half of the sternum are heaved up by every systole of the heart.

Let us trace the sequence of events in this heart. By the mitral regurgitation more work was thrown on the heart; the left ventricle became dilated and hypertrophied, and the right ventricle hypertrophied. The heart increased in bulk; for a time it had room enough inside the thorax to perform its systolic movements, but as it increased still more, room became deficient.

During diastole the heart is more or less flaccid, and accommodates its shape to that of the space in which it is placed; it encroaches at each side on the soft and yielding lung, and tends to increase laterally; but during systole, as the pressure rises, the heart becomes more globular, and increases in size from before backwards. But there is only a limited space between the spine behind and the ribs and sternum in front. When the heart hypertrophies to a certain degree, it comes to press during systole against the spine behind and the ribs and sternum in front. The spine is absolutely unyielding; the heart cannot gain any more space in that direction; so, as it increases further in size, it is forced in its systole to press the ribs and sternum forwards. So in this child we feel the sternum and the ribs rising perhaps one-sixteenth, perhaps one-eighth of an inch with each systole. To raise the lower half of the sternum and the fourth and fifth ribs even one-sixteenth of an inch eighty times a minute constantly day by day and week by week requires an enormous expenditure of energy. If at a post-mortem examination one hand is put under the sternum (the ribs being intact) and an endeavour made to raise it one-sixteenth of an inch, it will be found that it presents great resistance. And yet what the hypertrophied heart is called on to do is to raise the ribs or sternum in some cases fully one-eighth of an inch eighty or one hundred times every minute as long as the patient lives.

In the girl whose case I have described we may divide the extra work the heart is obliged to do into two varieties: (1) Internal, the extra work thrown on the heart by the leak in the mitral valve; and (2) External, the work which the heart is forced to perform in raising

the ribs and sternum with each systole. We cannot cure the leak; we cannot wholly remove the internal extra work, though by rest and appropriate treatment we endeavour to lessen it; but the external extra work, I think, can be removed by giving the heart space enough from before backwards, so that it may not be forced to move unyielding structures at each systole—that is to say, by resecting several ribs and, if necessary, a part of the sternum. For such cases I believe cardiolysis will be found of very great use, and if the condition of the patient is sufficiently good, I think we should very seriously consider the advisability of the operation.

To sum up. When we find that the ribs or sternum, or both, are distinctly moved up by each systole of the heart, I hold that this movement may be looked on as the heart's prayer for more room.

NOTE.—Since writing the above my colleague, Mr. T. E. Gordon, operated on the girl, and removed the cartilages of the third, fourth, and fifth ribs on the left side. The child bore the operation exceedingly well, and her general condition is somewhat improved, but it is too soon to form any opinion as to its ultimate effects.

REFERENCES.

¹ BRITISH MEDICAL JOURNAL, January 1st, 1910. ² *Lancet*, July 4th, 1908.

THE BOARD OF TRADE SIGHT TESTS.

WITH TWELVE ILLUSTRATIVE CASES.

By A. RUDOLF GALLOWAY, M.B., C.M., M.A.,

SURGEON TO THE EYE INSTITUTION, ABERDEEN.

In March and May, 1908, I published in the *Ophthalmoscope* particulars of eight cases of serious visual deficiency affecting responsible employés in the marine and railway services. Half of these were concerned with colour defects, and at that time I expressed the opinion that the Holmgren test carefully applied by properly qualified medical examiners was sufficient to detect all dangerous cases of colour blindness, although it might be necessary to supplement it by coloured lights capable of being partially obscured, so as to simulate fog, rain, or mist.

Since writing that paper, however, I have had experience of patients who could pass the Holmgren test without making any decided mistake, but who made serious errors when asked the colour of a light. The reason of this new development may possibly be found in the fact that all candidates who now present themselves for Board of Trade sight tests, have previously passed through a course of instruction in a navigation school, where sets of Holmgren's wools are kept.

As an example of this the following case may serve:

CASE I.

Towards the end of last year a navigation officer in one of the large steamship companies came for advice; he stated that he had passed his first examination three years before, his second two years later, but that he had failed to pass his third. With the Holmgren test no decided mistake was made, although it was done slowly; with coloured lights, however, white was called red and also green several times.

The lot of the Board of Trade lay examiners is not a happy one, as may be seen by reference to the "Regulations relating to the examinations of Skippers and Second Hands of Fishing Boats," "Exn. 1 (Fishing)," where it appears that they have to make a difficult medical diagnosis, and where faulty instructions are given in order to enable them to perform this impossible duty. It is stated on page 41 with reference to the form vision tests:

They also afford a means of detecting whether a candidate is suffering from that form of colour blindness which is caused by the excessive use of tobacco, and by illness or similar affections. All candidates who are suffering from colour blindness arising from causes of that nature will be found to be incapable of passing the tests for form vision.

The following case, in addition to illustrating the incorrectness of this statement, demonstrates the necessity for periodic examinations by properly qualified medical men.

CASE II.

A trawl skipper* has been under observation for some time, and now presents all the typical features of acromegaly. In September, 1909, while on full duty, the vision of his right eye

* This man died in the Royal Infirmary on April 1st, 1910. At the post-mortem examination a pituitary tumour (probably sarcomatous) the size of a large walnut was found, which pressed mostly on the left side. Death was due to erosion into the naso-pharynx and resulting left septic basal meningitis.

was $\frac{3}{8}$, but there was a central scotoma for green. The left eye happened to be much more seriously affected, and had vision of $\frac{3}{8}$ only, with central scotoma for form and colour. Even at the present time this man, quite unfit for duty, could easily pass the tests, provided he did not voluntarily elect to take the higher standard of form vision test, which is not compulsory till January 1st, 1914. For, with $\frac{3}{8}$ in one eye, whatever the state of the other, it is not necessary to use the pellet test.

The large number of rejections of candidates with normal colour perception by the examiners may be partly explained by reference to page 43, where Clause (5) states that the examiner "should note any incorrect skeins selected and withdrawn or seriously handled or compared with the test skein by the candidate," and report to the principal examiner. My experience is that the less intelligent class of candidates with normal colour perception always handle and select incorrect skeins, and that it sometimes takes much explanation to prevent this being done. The following is a case in point:

CASE III.

In November, 1909, a lad, who had just been rejected as colour blind in a Board of Trade examination, was brought to me by the family medical attendant, who witnessed the boy make several glaring mistakes in matching the Holmgren wools. Recognizing, however, that the mistakes were due to stupidity, I showed him coloured lights, which he named correctly in every case. On my advice he appealed, and successfully passed the examination in London.

Since November 1st, 1909, two additional test skeins—purple and yellow—have been added to the Holmgren test by the Board of Trade, thus stultifying the statement still given at page 42 that the colour vision is tested by means of Holmgren's wools. The addition of these two colours seems to be a tacit abandonment of the Young-Helmholtz theory of colour vision and the adoption of that of Dr. Edridge-Green. With its added complications, however, my expectation that this "improvement" in the hands of laymen would still further increase the proportion of "normal" rejections has been fulfilled. One of these cases is as follows:

CASE IV.

On January 10th I saw a fisherman who had been rejected for colours. On testing him, I found that he performed the Holmgren test correctly, and that he made no mistake with coloured lights, so I advised him to appeal. On February 15th I received a note from him stating that he had passed the tests in London.

The matching of a blue with the purple skein, or even an orange-yellow with the yellow, would necessitate the rejection of a candidate by a lay examiner who acted according to his instructions!

CASE V.

In January I examined a mate, who obtained his ticket two years ago, and who was about to apply for a skipper's certificate. He matched pink and blue, also yellows, drabs, and greens; he said yellow was green. When tested with coloured lights, he called white green three times, but made no mistakes with red and green.

CASE VI.

The father of this mate, who had been a trawl skipper for twenty-one years and is still on duty, was present at his son's examination. As he evinced no surprise at his son's mistakes, I managed, much against his will, to get him to submit to a superficial test. He also matched pink and blue skeins; moreover, he called a blue light green, and a green blue several times.

CASE VII.

In August last a man who held a second fisherman's certificate was rejected on applying for a mate's certificate. When tested by me with wools, he matched green and grey; pink and blue; red, green, and brown. With lights, he called dull-white green; red was also called green, and green was called red and also white.

CASE VIII.

In August, 1909, a fisherman, applying for a second hand's certificate, was rejected for colours. When tested by me, he matched pale-green with bluish confusion colours. Tested with lights, he called blue green, and green white regularly. Red he named correctly.

The following case, seen in December, 1909, illustrates the importance of the increased stringency of the form vision standard ($\frac{3}{8}$ in one eye and $\frac{1}{2}$ in the other) which was advocated in my paper in the *Ophthalmoscope*, but which is not compulsory till January 1st, 1914. (The old standard is barely $\frac{1}{12}$ with both eyes open and not tested separately.)

CASE IX.

In December, 1909, an A.S., aged 29, failed to pass the sight test at a navigation school.

His vision tested by me was:

Right, $\frac{3}{8}$ Hm 2 D. = $\frac{3}{8}$.
Left, $\frac{3}{8}$ Hm 5 D. = $\frac{3}{8}$ 3 letters.

Many hypermetropic cases of this nature could easily pass even the improved standard, and it is only a matter of time for failure of accommodation to cause unfitness for duty.

CASE X.

In February, 1909, a trawler went ashore in a snowstorm shortly after being left in charge of the mate, whose vision after the accident was:

Right eye, $\frac{3}{8}$ and J. 14. Convergence of 25 deg. and amblyopic.
Left eye, $\frac{3}{8}$ partly — 1 D. = $\frac{3}{8}$ partly.

This eye showed traces of old keratitis; a cycloplegic made no material difference to the refraction. Colour perception was normal.

CASE XI.

In February, 1909, I saw a mate who had been taking his turn of watch on a trawler until one week before the examination. He had had misty vision for three weeks, worse in sunlight. His vision was as follows:

Right eye, $\frac{3}{8}$. Central colour scotoma; disc pale.
Left eye, $\frac{3}{8}$. Central scotoma for green and red.

He smoked 2½ oz. of shag per week.

The following case will make an interesting finish to the present series:

CASE XII.

In December, 1908, I saw a fisherman who had obtained his mate's certificate, which, however, had been subsequently taken from him on failing to pass an eyesight examination. When tested with Holmgren's wools, with pink he matched yellow, with pale green he matched greys and browns. When tested with coloured lights, he called blue green, dull white red, dull red green, also green he called white. Consequently I refused to give him a certificate of fitness. Some time after he came back and told me the following story:

Being refused leave to appeal, he re-entered for the eyesight examination under an assumed name; he passed all three tests—form, colour perception, and colour ignorance—under a different examiner and obtained his certificate; he then wrote and informed the officials what he had done, whereupon he was summoned to a fresh examination and was rejected, the certificate being taken back.

In view of the undoubted possibility of dangerously colour-blind candidates passing the Holmgren wool test, and also of the frequent calling of white light red or green by certain classes of the colour blind, greater attention should be directed in future to Dr. Edridge-Green's wools and lamp, which provide for these and other contingencies.

A NOTE UPON PHLYCTENULAR AFFECTIONS OF THE EYE.

BY

SYDNEY STEPHENSON, and J. A. JAMIESON,
M.B., M.B.,
OPHTHALMIC SURGEON, RESIDENT MEDICAL OFFICER,
THE QUEEN'S HOSPITAL FOR CHILDREN, LONDON, E.

THE view that phlyctenular affections of the conjunctiva and cornea are tuberculous is an old one. The earlier writers spoke of the affection as "strumous" or "scrofulous ophthalmia," a name which indicates clearly enough the view held by them with regard to the origin of the disease. But with the more or less general abandonment of the vocable "strumous," which marked the era following the discovery of the specific micro-organism of tuberculosis by Koch in 1882, there came a corresponding giving up of the word as applied to those affections of the eye. The suggestion made many years before by the famous Glasgow oculist, William Mackenzie, that for "strumous" the word "phlyctenular" should be substituted, was very generally adopted, except perhaps in Germany, where the disease is usually spoken of as "eczematous" conjunctivitis or keratitis, as the case may be.

The pendulum has now swung in the opposite direction. The tuberculous or para-tuberculous origin of phlyctenular disease, after having been under a cloud for a good many years, is again to the fore. Nobody asserts that the