Original Articles.

THE IMPORTANCE OF RE-EXAMINATIONS AS TO THE ACCURACY OF VISION OF RAILROAD EMPLOYEES AND MARINERS.

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AFTER the enactment of the law requiring that tests should be made as to the accuracy of perception of colors, and as to the sharpness of vision of mariners and of railroad men, who are required to readily distinguish signals, obstructions, or other intimations of danger, the railroad officials of Massachusetts manifested a willingness to at once comply with the demands of the Statute, so far as a first examination of their employees was concerned, although the managers of, at least, one road, seem to have deemed it sufficient if danger-signal flags or lanterns could be distinguished from those denoting safety, when displayed, one after another, at certain distances — a test which all experts know to be fallacious, as it *does not* prove an ability to distinguish signals when unexpectedly shown, or when they are soiled, or faded, or dimmed, since, especially in these circumstances, those who are color-blind readily mistake one for the other.

These Statutory examinations give a result similar to those obtained on a very large scale in this and other countries, showing that, as an average, about four per cent. of males have dangerously imperfect ability to distinguish red from green, the colors of most frequent use in signalling. They also demonstrated what is of yet more grave importance; that, in a still larger proportion, defects of visual acuteness existed in men who were supposed by others, and often by themselves, to have good sight.

These demonstrated facts, and the occurrence of such instances as the running over and killing of a brakeman holding a red danger-signal on the track in front of his train, by an engineer who was afterwards found to be color-blind, would seem to be sufficient to satisfy the observant officers of railroads, and owners of ships, of the necessity of the required tests for all entering their service who were to fill positions where prompt recognition of signals, and quick and accurate perception of objects, is required; and this not only as an imperative duty towards the persons whom they undertake to transport in safety, but also as being necessary as a safeguard for their property, in avoiding the enormous costs of accidents, and the exemplary damages which would be awarded where it was proved in court that an accident had resulted from the color-blindness or defective sight of an employee.

As regards the men themselves, their rejection, if found to be visually defective, cannot be reckoned as a hardship, since it is especially for their advantage that they should turn to other avocations, rather than assume positions which imperil their own safety, as well as the lives and property of others; or, at least, that they should be assigned to duties for which their natural or acquired visual defects do not disqualify them.

The importance of the elimination of incapacitated men from the marine and railroad service, as shown and insisted on, especially, by Professor Holmgren, of Sweden, and Drs. Thomson, of Philadelphia, and Jeffries, of Boston, has lately been brought prominently before the public by a riotous resistance to examina-

tion, as to their visual capacity, by the 42,000 employees of one of the large American railroad corporations; which, for a time, threatened a total suspension of traffic upon this road. As regards this event, Dr. William Thomson, who acted as an expert in deciding the controversy, says (*Medical News*, August 13th): "The conflict is nearly over, since demonstrations of the optical defect in engineers, made before a committee appointed by the employees, have satisfied them of the propriety of the testing, and that the safety of the public demands the removal of all color-blind persons from positions where their optical defect might be the cause of distressing accidents. In the recent demonstration, I was able, at my office, to show that an engine-man declared a red danger-signal, made by placing red glass in front of a large gas-light, at the distance of two feet away, to be a green glass. He was not only unable to distinguish a red from a green flag within six feet, but he failed to classify the flags, white, red, green, and blue, properly, even when allowed to take them in his own hands." Instances such as these cited are constantly met with by ophthalmological experts.

Attention has also lately been called to this matter by articles in some of our newspapers, referring to the disturbances above mentioned; giving certain statistics of the results of examinations on the Pennsylvania Railroad, which seemed to be misleading, as being inconsistent with those previously obtained on this road, and with the usual average of imperfect color-perception and of visual defects, as observed in various European nationalities.

These statistics were as follows:

Total number examined on lines east of Erie, . .	25,158
Color blind,	481
Defective vision,	661
Defective hearing,	158

In reply to questions regarding these tables, Dr. Thomson writes to me as follows:

"In 1884, the examinations of men who had to do with signals amounted to about 13,000. When the total increases to 25,000, and comprises many men coming into the service, the percentage must be smaller. The apparently small percentage of color-blind in this table may be ascribed to the non-application of men who know their deficiency, and to the fact that men in the service knowing their defect, would leave the road before examination, and thus escape detection, and be enabled to gain employment on other roads, where no examinations are required. New men would present a small ratio of those below the standard, since men conscious of color-blindness or poor sight would not apply."

There is reason to believe that, even in Massachusetts, the provision of the Statute which calls for re-examination of employees at stated intervals has been but negligently fulfilled. Admitting that those once found to have good power of distinguishing colors seldom lose this ability, and scarcely require as frequent re-examinations, the same is not true as to other visual deficiencies. Sharpness of sight is not a fixed quantity, and lessening of visual acuteness may occur at any time, and from many and various causes, in those whose sight had been found to be perfect at a former examination. Normal changes of visual power occur at different ages, and, although these, as well as some abnormal conditions of the refraction and accommodation of the eye, may, perhaps, be remedied by the use of glasses, yet the necessity of wearing glasses

is, in itself, an important disability, inasmuch as spectacle-glasses are liable, especially in cold weather, to be suddenly obscured by a puff of steam or smoke, or by fog in the atmosphere, and the wearer is thus rendered *pro tempore*, and perhaps, again and again within the space of a few minutes, virtually blind, until the glasses can be removed and wiped. But vision may also be gravely impaired, at first gradually, and perhaps, nearly imperceptibly to the person himself, by the development of cataract, of Bright's disease, of various slowly-advancing brain lesions, etc., as well as by numerous forms of disease of the internal parts of the eyes not discoverable by external inspection. These constitute a grave danger, especially as the afflicted person, even if conscious that he sees less distinctly, clings to the hope of an improvement, and is reluctant to give up his means of support.

Doubtless the omission to comply fully with legal requirements, and the neglect of self evidently necessary precautions, has arisen from inattention in a matter which is even yet a comparatively new subject to the railroad authorities; but the frequent revelation of cases of greatly depreciated sight in employees whose vision had been found to be good no longer ago than two years, proves the need of vigilance to *discover* these defects by re-examination, before they become a source of disaster. If scrupulous exactness should ever be insisted on, it should be in the use of every precaution where the safety of great numbers, or of vast property, may depend on the clear vision of one man.

What can be said of the false economy and culpable negligence existing in some States, where, because no Statute compels examinations as to the perfection of sight and hearing of employees, the managers of railroads feel justified in dispensing with them. They thus incur the risk, not only of having the usual average of about four per cent. of color-blindness, and ten per cent. of imperfect sight, among their employees, but also of making their roads asylums for many discarded men, who have been elsewhere tested and found wanting in the essential qualifications of good vision.

A not unimportant element of this question is the ease with which complete security can be obtained. As stated by Dr. Thomson: "The officers needed a system that could be employed on each division of the road, quietly and confidentially, and at the convenience of the men, without compelling them to lose much time. These and other considerations led me to the invention of an instrument for an examination of the color-sense, which could be used by any intelligent, instructed official, and a record of the examination permanently kept for the information of the officers, and as a guide for any expert to whom the road might wish to refer any doubtful cases." This system has been in use for more than five years on the Pennsylvania Railroad, with its now 7,000 miles of track, and over 100,000 employees.

— A case is recorded by Dr. C. R. Eckhardt of carcinoma uteri (diagnosis established by histological examination) in a virgin, aged nineteen. It is said that thus far only three cases have been recorded of this disease occurring before the age of twenty. The growth was removed with a galvano-cautery snare by Fränkel.

A CASE OF ACUTE RED ATROPHY OF THE LIVER.¹

BY A. F. HOLT, M.D., OF CAMBRIDGE.

At one o'clock in the morning of November 13th, Mrs. M. came to the police station to make a complaint against her husband for beating her. She claimed that he had choked her until she was unconscious, that while he held her on the floor, he jumped on her chest on his knees, and it was only with the greatest difficulty that she escaped from him and ran to the police station, a half-mile or more away, clad only in her night-dress and stockings. The husband was arrested, and at the trial, the following morning, the wife testified that her husband had only held his hand over her mouth. The wife, after the assault, went to the house of her mother, instead of returning to her own home, and there she remained until her death, nine days after. For the next four days, she was about the house and the street, and a part of the time, at least, was under the influence of liquor. During these days, she called on Dr. Church once for examination as to the injuries which she had received from the assault by her husband. At this interview, she complained of soreness in the right chest. Physical examination showed nothing, except a few scratches and a small black-and-blue spot near the sternum. Her pulse and temperature were normal.

The afternoon of the 19th, Mrs. M. was seen by Dr. Bryant, the city physician, at the office of the Overseers of the Poor, and from him I obtained the following history: Age, twenty-nine years; there is a black-and-blue spot about the left eye, whites of both eyes jaundiced, and the skin of the chest and abdomen is yellow. She is constipated, has a slight cough, and complains of great weakness. One gramme of calomel was ordered, to be taken at once.

November 21st. Saw her at her mother's house at 10 o'clock, A. M. She was in bed, and very restless. Hands and feet cold, and the pulse 108; complained of constant nausea, and had vomited a great many times since last seen. Liver-dulness about normal; bowels moved slightly yesterday. One gramme of calomel, to be given in two doses; mustard to stomach, and ice-pills.

4 o'clock, P. M. Has not vomited since morning; has not spoken since one o'clock. Bowels have not moved. She is unconscious, but very restless. Brandy and milk every hour, and an injection of warm water.

At 7 o'clock, P. M., saw the patient, with Dr. Church. She is still very restless. No discharge from the bowels. Temperature slightly subnormal, pupils respond to light, slight, crepitant râles at the base of both lungs, and the liver-dulness has disappeared. Pulse rapid and feeble; has passed no urine for twenty hours. Hands and feet and end of nose cold; skin everywhere deeply jaundiced. The patient continued to fail, and died at one o'clock the following morning, or about eight hours after the doctor last saw her. The claim was at once made that death was the result of injuries received at the hands of her husband, and he was arrested to await an investigation. The autopsy was made thirty hours after death, and the following is the record:

Body fairly well nourished; pupils a little dilated. There is a black-and-blue spot under the left eye, but

¹ Read at a meeting the Boston Society for Medical Observation, May 2, 1887.