

Steel Rails of Uniform Physical Properties Follows the Comparative Moments of Inertia of the Respective Sections.' Mr. Dudley described the improvements in the manufacture of steel rails which has been carried out under his direction during the last five years. The object was to produce a much stiffer rail than that which had been previously employed, and at the same time to make one out of a higher grade of steel. The rails have now been in use several years on the Boston & Albany and New York Central railroads, and they show a marked improvement over the old patterns in that the deflections have been decidedly lessened. Careful records of them have been kept by means of Mr. Dudley's track inspection machine. A great deal of information has also been accumulated by Mr. Dudley in connection with the tests of samples from each heat of steel in the process of manufacture. The full paper will be subsequently published by the Academy.

In the absence of Prof. Jacoby the contents of his paper on 'The Permanence of the Rutherford Photographs' were briefly summarized by Prof. Rees. Recent and very careful measurements made upon Rutherford negatives, which had been developed twenty or thirty years ago and which had been measured five to ten years ago, show absolutely no change in the plates, so far as could be detected. The film remains in the same part of the glass as when first studied. The negatives were made upon wet plates, and the speaker remarked that it remains to be shown whether the newer dry plates afford the same permanence.

The next paper was by Prof. J. K. Rees, on: (1) 'The Harvard College Observatory photographs of star clusters, planets, variable stars and stellar spectra.' (2) 'Prof. J. E. Keeler's photographs of planetary spectra.' Prof. Rees exhibited a large series of photographs of various astronomical subjects, which had been loaned by Prof. Pickering, of the Harvard Observatory, for the recent exhibition of the New York Academy of Sciences. He also threw upon the screen, by means of the lantern, a series of photographs of star clusters which included variable stars, and which show these variables at different periods. The originals were taken at the Harvard Observatory.

In the second part of his paper Prof. Rees threw upon the screen enlargements from photographs of stellar spectra which had been taken by Prof. Keeler, of the Observatory at Allegheny, Pa. The photographs of the spectra of Saturn were also shown, which prove that the ring about the planet is due to a stream of meteorites.

The last paper of the evening was the following by Prof. M. I. Pupin: 'Communication of some new Results of Experiments with the Röntgen rays.' This paper was printed in full in SCIENCE. April 10. Experimental demonstration of the points advanced was subsequently made for the members of the Academy in Prof. Pupin's laboratory.

J. F. KEMP,
Secretary.

NORTHWESTERN UNIVERSITY SCIENCE CLUB.

At the meeting of March 6th, Dr. Marcy in the chair, papers were presented by the Department of Mathematics.

Prof. Holgate gave the 'Problem of the Eight Queens,' which is to place eight queens on a chessboard that no one will be endangered by any other, or, in general, to place n pieces on a square board so that no two will be in the same row, same column, or same diagonal. This problem was first proposed by Nauck to Gauss, was the subject of correspondence between Gauss and Schumacher and was finally solved by Gauss in 1850. In 1874 Günther suggested a solution of which Glaisher made use in a solution which he published that year in the *Philosophical Magazine*. Dr. Holgate presented Glaisher's solution in full.

Prof. White presented Poncelet's problem concerning polygons that possess both an inscribed and circumscribed conic. The parametric representations of the points of a conic, the doubly quadric relations of pairs of points, and the statement of periodic relations of this kind by the aid of elliptic functions, were treated in the manner of Euler, Jacobi and Hurwitz.

A. R. CROOK,
Secretary.

EVANSTON, ILL.

Erratum:—On page 604, paragraph 2, line 2, for *Instinct* read *Insect*.