unsatisfactory. Nor were these discrepancies without law, as representing their residuals by curves did not fail to show. By introducting corrections for declination and parallax of the moon increasing and decreasing, we reduced these discrepancies, but still the results were not sufficient approximations. With the numerical reductions of the observations before referred to, was commenced in 1853, under my immediate direction, by Mr. L. W. Meech, a study of the theory of the tides, directed chiefly to the works of Bernoulli, La Place, Avery, Lubbock and Whewell The immediate object which I had in view was the application of the wave theory to the discussion of our observations. I thought that the mind of an expert mathematician, directed entirely to the theoretical portions of this work, with direction by a physicist, and full opportunities of verifying results by extenced series of observations, the computations of which should be placed by others in any desired form, would give, probably, the best result in this combined physical and mathematical investigation.

The general form of the different functions expressing the tidal inequalities is the same in the different theories, and may be said on the average to be satisfactory as to the laws of change which these inequalities present. Whether we adopt, with La Place, the idea that periodical forces produce periodical effects, or with Avery, that the tidal wave arrives by two or more canals; or with Bernoulli and Lubbock, the results of an equilibrium spheroid; or with Whewell, make a series of inequalities, semi-menstrual, parallax and declination, with different epochs, we arrive at the same general results, that the heights and times of high water may be represented by certain functions, with indeterminate co-efficients, in the form of which the theories in a general way agree. By forming equations from the observations, and obtaining the numerical values of the co-efficients by the methods used so commonly in astronomical computations, the result is accomplished.

A general consideration of the co-ordinates in space of the moon and sun, without any special theory, would lead to the same result, representing the luni-tidal interval by a series of sines and co-sines, with indeterminate co-efficients.

The grouping of the observations of one year at Boston, to apply this method the formation of the equations and their solution by the method of indirect elimination has been the work of Mr. R. L. Avery.

To test the co-efficients, computations, for the predicted times of the tide at Boston harbor were made for a period from March 1853, to January 1854, and from comparison of these with the observed, it appears that in twenty pairs of tides, the morning and afternoon being grouped to get rid of the diurnal inequality, there are two differences of less than two 2 m., thirteen of more than 2 m. and less than 4 m., three of more than 4 m. and less than 10 m., two of more than 10 m. The probable error of the prediction of a single pair of tides is 4.12 m. so that greater accuracy of prediction has been attained by this method from a single years's observations that was found at London bridge from a period of nineteen years.

LAW OF MORTALITY.

Prof. McCoy, of Albany, read a paper in which he announced the important discovery of a mathematical formula which correctly expressed the law of mortality for all ages; it was first evolved from an analysis of the Carlisle and Northampton tables, but the Professor had compared it with a large number of others and said that, "so complete is its agreement with all, that at no age does the calculated number of the living differ from the number given in the tables by