pression of contentment with and acquiescence in the results of science, which seems to find easy access to trained as well as untrained minds before an investigation is half completed or even fairly begun. That some such tacit persuasion of the completeness of the knowledge of the earth has at times pervaded scientific thought, there can be no doubt. This was notably the case during the period which followed the remarkable epoch of Laplace. The profound impression of the sufficiency of the brilliant discoveries and advances of that epoch is aptly described by Carlyle in the half humerous, half sarcastic language of Sartor Resartus. "Our Theory of Gravitation," he says, "is as good as perfect: Lagrange, it is well known, has proved that the Planetary System, on this scheme, will endure forever; Laplace, still more cunningly, even guesses that it could not have been made on any other scheme. Whereby, at least, our nautical Logbooks can be better kept; and water transport of all kinds has grown more commodious. Of Geology and Geognosy we know enough: what with the labors of our Werners and Huttons, what with the ardent genius of their disciples, it has come about that now, to many a Royal Society, the creation of a World is little more mysterious than the cooking of a dumpling; concerning which last, indeed, there have been minds to whom the question *How the apples were got in*, presented difficulties." This was written nearly sixty years ago, about the time that the sage of Ecclefechan abandoned his mathematics and astronomy for literature to become the seer of Chelsea, but the force of its irony is still applicable, for we have yet to learn, essentially, "how the apples were got in," and what kind they are.

As to the future, we can only guess, less or more vaguely, from our experience in the past and from our knowledge of present needs. Though the dawn of that future is certainly not heralded by rosy tints of over-confidence amongst those acquainted with the difficulties to be overcome, the prospect, on the whole, has never been more promising. The converging lights of many lines of investigation are now brought to bear on the problems presented by our planet. There is ample reason to suppose that our day will witness a fair average of those happy accidents in science which lead to the discovery of new principles and new methods. We have much to expect from the elaborate machinery and perfected methods of the older and more exact sciences of measuring and weighing — astronomy, geodesy, physics, and chemistry. We have more to expect, perhaps, from geology and meteorology, with their vast accumulations of facts not yet fully correlated. Much, also, may be anticipated from that new astronomy which looks for the secrets of the earth's origin and history in nebulous masses or in swarms of meteorites. We have the encouraging stimulus of a very general and rapidly growing popular concern in the objects of our inquiries, and the freest avenues for the dissemination of new information; so that we may easily gain the advantage of a concentration of energy without centralization of personal interests. To those, therefore, who can bring the prerequisites of endless patience and unflagging industry, who can bear alike the remorseless discipline of repeated failure and the prosperity of partial success, the field is as wide and as inviting as it ever was to a Newton, or a Laplace.

AMONG THE PUBLISHERS.

"TERMINAL facilities of New York" is the title of the supplement feature in *Harper's Weekly* for Aug. 31. The article is from the pen of Mr. G. T. Ferris, and the illustrations, of which there are thirteen, were drawn by Messrs. Schell and Hogan.

— Following the article on the late Miss Laura Bridgman, in the August *St. Nicholas*, the number for September contains an account of "Helen Keller," the young girl also deaf, dumb and blind, whose rapid advance in her studies was described in *Science* a year ago. The sketch is by Florence Howe Hall, a daughter of Dr. Howe, and contains portraits of the child, of her teacher, a facsimile letter from the little girl herself to Mrs. Hall, and other illustrations. In the same number Lieutenant Hamilton gives a sketch of the modern method of defending coasts or harbors, and shows how necessary such defences have become as a consequence of the development of the world's navies.

— The September number of the *Political Science Quarterly* contains a critical estimate of the work of Thorold Rogers, by Professor W. J. Ashley of Toronto University; a demonstration of the "radical unfairness" of representation in Connecticut under the town-rule system, by Clarence Deming of New Haven; a discussion of farm mortgages, by an Illinois farmer, W. F. Mappin; a strong attack upon the policy of the general land office as regards the "indemnity lands" granted to the railroads, by Fred. Perry Powers of Washington, D.C.; a statistical paper upon Italian immigration, by Hon. Eugene Schuyler; the first of two papers upon the materials for English legal history, by Professor F. W. Maitland, Downing professor of law at Cambridge University, England; and the usual number of book reviews.

INDUSTRIAL NOTES.

Electrical Apparatus Abroad.

INFORMATION has reached us that the Sprague Electric Railway and Motor Company has recently closed quite a large contract for electric street railway apparatus with the principal street railway company of Florence, Italy, for the equipment of their line. This apparatus includes overhead system of the regular Sprague type, ten complete car equipments using two thirteen horse-power motors on each car, and station equipment complete.

This will be the first installation of American street railway apparatus abroad, where the progress in electric railway science has been very slow. The present method of running street cars in Florence is partly by animal power and partly by small steam dummies; and it is thought that the electric cars which combine the safety of the horse-car with the speed of the steam-car, and are much cheaper to operate than either, will have a large field to fill. It is said that this equipment is only a small portion of a very large equipment which will be ordered by this company, and if the result proves successful, it is thought that very many other Italian cities will adopt electricity for their street cars.

Electricity at Cleveland.

Cleveland can now be called properly the electric city of the West. In a short time there will be over a hundred electric street-cars running over the principal streets of Cleveland, besides a large number of stationary electric motors in use in a great many varied industries throughout the city.

The history of the East Cleveland Street Railway Company, which was the first in Cleveland to adopt electricity on its line, is an instance of the success and satisfaction which electric street railway cars are giving in every city where they have been installed. The first equipment of this company was installed by the Sprague Company about nine months ago, and included overhead line, station equipment, and sixteen electric motor cars. The proposition to install this line met with a great deal of opposition in Cleveland.

The electric line was to cover some of the most important and principal business and residential streets in Cleveland, but the equipment was finally installed; and after it had been put in operation, the citizens of Cleveland discovered that the neat iron poles and overhead erection were hardly noticeable, while the rapid transit afforded by the street cars was something vastly superior to the former slow service given, when the cars were drawn by animal power.

There have altogether been five separate orders given by the East Cleveland Company for electric car apparatus. The second order was for four additional cars, the third for eight additional cars, the fourth for eighteen additional cars, and a recent order placed with the Sprague Company by its agent, Mr. C. W. Foote, for thirty additional motors, making seventy-six motor cars to be operated on this one line.

Besides this road, there are two others in Cleveland; the Broadway and Newburgh, and the Brooklyn Avenue roads also operated by electricity. There is nothing which speaks more highly for any kind of apparatus than the indorsement by its users, and there is no indorsement more convincing than the continued addition to an original equipment. The results, therefore, at Cleveland prove conclusively the good results and satisfaction given by electric apparatus when applied to street railways, and cannot be too commendatory of the style of motors used.