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## THE ORIGIN OF AMERICAN MECHANICAL GENIUS.

The London *Times* of August 22 prefaces a long account of the American mechanical display at Paris with the following remarks:

"It may almost certainly be predicated of any modern mechanical congress that the Americans will carry off the palm for novel and ingenious application of force to practical purposes, the substitution of mechanism for hand labor in new and curious contrivances, which, to the amateur in such matters, surprise as much by the new ways in which old problems are attacked as by the fine way in which the work is done. The mass of invention and practical result from it produced by the Americans within the century, and especially the last 20 or 30 years, is so great and so important in results, that it presents an important problem in political economy—one especially interesting to Englishmen, as American mechanism is an offshoot from English, but an offshoot so peculiar in its character that mere heredity will not quite explain it.

"A traveler in the New World once said that the most interesting thing in America was its Americanism, and so we may say that the most curious feature of American mechanics is its distinctively American feature. As mechanical science progresses, the greater and more important inventions become elaborated by, and the property of, the nation who push that science furthest in its experimental studies. The result is foreseen, studied, and developed with method and certainty, and great industrial revolutions are effected with a certain and almost calculable progress. In this progress England has long led, and still leads, the world, owing to favorable conditions of capital and labor. Fulton built the first successful steamer on American waters; but all the latest and most important advances in steamship building are English, and the great mass of the steamers afloat are English. The first monitor was American; but the puny craft of that construction across the Atlantic would all go down before one of the last English build; and though Rodman and Dahlgren instituted the experiments to which we owe most of the present knowledge of the power of artillery and gunpowder, English artillery has left the practical transatlantic results out of the chance of competition.

"Yet in spite of this the activity and insight of the American inventive genius develop more that is new and practical in mechanism than all Europe combined. The New Englander invents normally; his brain has a bias that way. He mechanizes as an old Greek sculptured, as the Venetian painted, or the modern Italian sang. A school has grown up whose dominant quality, curiously intense, wide spread, and daring, is mechanical imagination. It is not the professed mechanic or iron master who invents, any more than the schoolmaster or the farmer. As Tintoretto left his dyeing to become a great painter, the American, be he bank clerk, pedagogue, backwoodsman, or plowman, turns in his busy brain some problem of his own, suggested by his experience of ill or too slowly done work, and like Archimedes in his bath, he suddenly finds it and rushes away with his 'Eureka' to some place where he can make his model or get it made—more frequently the former for want of funds to get it made. There was a want the man had felt, an ideal to be worked out, and in his meditation suddenly the thing flashed on him, and is complete in all its essential parts from that moment. The number of inventions, useful and useless, thrown off in this way in the course of a year, of which only a small proportion attain the realization of the Patent Office, can only be imagined by those who have lived among New Englanders at home."

The *Times* evidently uses "New Englander" to represent the inventive American type, not merely the men who live to the eastward of the Hudson. That type of creative thinkers prevails across the entire breadth of the States; and every year sees its development more and more to the southward. Why? It will not suffice to say that the American has a bias toward invention. How came he to have such a bias? Not by inheritance surely, for his ancestors in Europe were not distinguished that way. Not because he came of good stock, and was early thrown on his own resources, with a new world to conquer before him. The colonizing of new lands by a free and vigorous people has happened many times in the world's history, but a race of inventors never appeared before. Scarcity of labor could not have been the original cause; for in all other similar cases the result has been a natural limitation of the amount of work attempted, not a phenomenal increase of achievement through invention. No doubt these, and other conditions favorable to the development of personal vigor and individuality of character, have helped to cultivate the faculty of creative mechanical imagination, which, in its intensity, universality, and daring, has become the distinctive American characteristic. But they cannot be the mainspring of American inventiveness, for the simple reason that they are not distinctively American in origin, or more generally prevalent here than in other regions not remarkable for the inventive genius of the people.

There is a factor, however, which was early brought to bear upon the industrial development of American thought—a factor to whose influence American inventions can be directly traced in almost every instance; a factor distinctively American in spirit and character. That is the American patent system. If America has led the world in the evolution of new and useful ideas, it is because America was the first to see the need of, and to practically recognize the justice of, a liberal recognition of the rights of property in new ideas. It was very early discovered in consequence that one of the quickest ways to wealth and honorable fame was through creative thought; and creative thinking became as a natural result the desire and aim of all classes of our people. The American, whatever his calling, is forever on the outlook for novelty, and thousands make invention the business of their lives, because there is money in it. A patent costs little and may bring a fortune; and the stimulus thus provided has made every American workshop an industrial school, more and more, every year, striving for the grand prize—a profitable patent. It was this feature of American life which so forcibly impressed the foreign commissioners to the Centennial Exhibition—which made them all so eager on their return to have their home governments imitate the American Patent System. The contrast between America and Europe on this score has been enormously diminished by the new laws of our European rivals. And though, in liberality to inventors, our system still bears the palm, it may be well worth while to consider whether we cannot profitably increase the incentives offered to inventors—especially inventors with little capital—and so make sure of maintaining the lead which liberality has thus far secured to this country.

After the foregoing was written and in type, the copy of the *Times* from which the quoted extract was taken came to hand. A paragraph not given in the early report happily justifies the explanation we have offered as to the fundamental condition of American inventiveness. In it the *Times* goes on to say:

"There can be no question that the efficiency and moderate cost of patent right protection in America should have the greater share of the credit of this immense activity. Invention pays, and the action of the patent laws is so secure and equitable that the investment in brain labor is a safe one, while the expense of securing a patent is so small that the capital required for preliminary enterprise is within reach of almost every inventor. A patent right is the El Dorado of the New Englander, and thousands delve there with an assiduity no mere love of invention could inspire. This is not conjecture or *a priori* conclusion, but opinion based on years of intercourse with the inventing Yankee, and actual experience of the working of the American patent system, which, if not perfect, is so far in advance of that of any other country that we may safely say that never has wisdom in legislation more completely brought its own reward. The economy of wages from labor saving machines in the United States is almost incalculable, while the tax for royalties on patents taken out in England alone must constitute an important item in the finances of American industry."

## THE UTILIZATION OF WEEDS.

Ralph Waldo Emerson has described weeds as plants whose use has not been discovered. Too often men are content to call a plant a weed and then proceed to exterminate it without making any attempt to find out its possible uses. An Indian writer, Mr. George W. Strettell, considers from his experience gained in the Indian Forest Department that a large revenue might be derived from such plants, especially those yielding fiber—plants which require no care in cultivation, which will grow in land utterly unsuited to any other crops, and which yield fiber practically proved to be well adapted to the manufacture of paper and textile fabrics. He advocates the cultivation, at first if need be experimentally, and on a small scale, of several different plants, and especially of one, the *Calotropis gigantea*. The fiber of this plant has been pronounced by paper makers and manufacturers of textile fabrics as excellent; and he shows convincingly that after allowing for the cost of cultivation and of extracting the fiber, the raw material might be sold at such a price as to add considerably to the Imperial revenue.

Next to the discovery of plants yielding products now in demand for industrial or medical purposes, we may rank the invention of new uses for the products of plants now considered useless. But a small portion of the vegetable world has yet been made tributary to man; and from past experience it is safe to predict that even the most noxious of weeds may yet prove to be of the highest utility.

## MENTAL EXPERIMENTING.

The reduction of experiment to a mental operation is a wonderful faculty possessed by some men. They are able to plan and arrange the parts of a machine, the steps in a process, or the intricacies of a design by a purely mental act, so that when the device is embodied in matter it is the exact representation of the thing pictured in the mind. This rare faculty is not wholly a gift, as it may be acquired to a greater or less degree, and there appears no reason why it should not be more generally possessed.

The one who at the first mental inception begins to put the subject of his thoughts into tangible form by experimenting with material things, not only adds expense to his experiment, but at the same time cripples his faculties by failing to give them the opportunity to expand, as they might have done had not the effort been complicated by physical action.

The patience of inventors too often and too easily is overcome by their great desire to see the embodiment of an idea, hence the crude and imperfect inventions, and the rough, unshapely, and unscientific machines, which exist but for a brief period, and are afterward to be found disorganized and laid away, covered with dust, corrosion, and cobwebs, the evidences of disuse.

The best proofs of the lack of the sort of mental work we