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JOHN ROACH.

This distinguished shipbuilder died at his home in Fifth Avenue, New York, January 12. He was born in County Cork, Ireland, in 1815, and came to this country when fourteen years of age, having less than three shillings in his pocket when he landed. This is substantially the story of many thousands of Irishmen who have come to America, but in none of them have the qualities of pluck, energy, and business capacity found more splendid exemplification than in the career of John Roach.

His first positions were in the Howell and Allaire iron works, New York, at 25 cents a day, and during this period he was obliged to work overtime nights and mornings to obtain a bare subsistence. His apprenticeship finished, he became a journeyman machinist at \$9 a week, and by close work and rigid economy had, at the age of 25, accumulated \$1,200, but the most of it was lost by the failure of his employer, and he was obliged to work as a mechanic for several years more; he worked hard, however, and was ambitious, and found himself, when 36 years of age, the owner of a prosperous iron foundry which had been started by himself and three of his fellow laborers.

From this period, notwithstanding frequent discouragements, Mr. Roach's business progress was steady. The war gave an immense impetus to all branches of manufacture, and in 1868 Mr. Roach purchased the Morgan Iron Works, of New York city, subsequently adding thereto the Neptune Iron Works, the Franklin Forge, and the Allaire Works, and four years later buying an extensive shipbuilding plant at Chester, Pa. All of these establishments, machine shops, boiler shops, iron foundries, rolling mill, blast furnace, and shipyard, were large and well equipped, it being Mr. Roach's idea to take the ore and the coal from the mines, and the wood from the forest, to his own workshops, and turn out therefrom the completely built and furnished ocean steamship. Shipbuilding on a more extensive scale than was ever before attempted in this country was thus inaugurated by Mr. Roach.

In New York and at Chester 3,000 men were employed, and 114 iron vessels have been sent out from his workshops. It has been estimated that 90 per cent of all the iron vessels flying the American flag have been turned out from Mr. Roach's yards. His work for the Government has not been as large as generally supposed. He built two sloops of war in 1873, six monitors, the engines of the Trenton, the sectional dock for the Pensacola Navy Yard, three steel cruisers, and the Dolphin. Among his other work may be mentioned the engines of the Dunderberg, the Bristol and Providence, and the hull as well as the engines of the Puritan, these famous steamers having the largest engines ever built in this country. He also built the Pacific Mail steamships Tokio and Pekin, the City of Para and Rio Janeiro for the Brazil line, with many others for the Mexican, West Indies, and coastwise trade, besides some fine specimens of steam yachts.

But Mr. Roach has filled a larger place in the public eye than would ordinarily come of the accomplishment of this great amount of work, important as it has been. During the last quarter of a century, the country has been gradually falling behind the rest of the world in shipbuilding. With the advent of iron ships, so far from taking the lead we unquestionably held in building wooden vessels, it seemed as though we were to have no ships of this class to carry the American flag. Mr. Roach has stood forth almost alone in making the most vigorous effort to encourage and develop this business. He has not only written and spoken much on the subject, in such way as so direct a business man could, but he has put his money, energy, and mechanical skill as well into the work, and in this way has succeeded, notwithstanding great obstacles, in demonstrating the possibility of easy success for American builders in this field, under slightly more favorable circumstances, as well as given to our flag some specimens of marine architecture that will compare favorably with vessels of a similar class made anywhere else.

In view of these facts, it is painful to have to record that probably his life was shortened, as his last year was certainly made extremely unhappy, by the consequences of the differences between his firm and the government as to the acceptance of the dispatch boat Dolphin. It is not necessary to go into details in regard to the matter, further than that they are largely charged to the exigencies of the time among political wire pullers and the blundering of the Secretary of the Navy, but their effect was to compel an assignment by him in July, 1885. It has since been decided that the fault found with the Dolphin was of a very minor and unimportant character, so far as the builder's work was concerned, but an irreparable injury had been done to the great shipbuilder. His assets were largely in excess of his liabilities, and a comfortable fortune will remain from them for his heirs, but a fatal blow had been struck to the extensive business which he had founded and developed, and which was the pride of his declining years.

John Roach's life was a brave and inspiring one. He started from about as lowly a position as one well could be placed in; such time as could be spared

from absolutely necessary work he devoted to self-improvement in study, for which he otherwise had no opportunities; and in all his complicated business in after life, he was not only the master mechanic, but his was the designing mind; in all his business character his methods were simple and direct, so that he never had a lawsuit; to all of his little army of employes he was a personal friend and an example of the possibilities open to every one who wished to follow in his footsteps; and in his relations to the general public he was a patriotic and eminently useful citizen.

THE INVENTOR'S WORK IN AGRICULTURE.

The conditions of the welfare of countries have undergone very great changes during the last fifty years. Up to a comparatively recent period, it was almost an axiom of political economy that the farmers were the producers of the true wealth of a region. They worked a mine that was inexhaustible if proper treatment was awarded it. If the soil became spent, it was interpreted as a sign of faulty agriculture. Properly treated, the same land could be used, year in and year out, and would yield a constant return for labor expended and capital invested. The coal miner works out a deposit of coal and abandons the region, after cumbering many acres with heaps of culm. The metallurgist builds his furnaces near the source of supplies, to be abandoned when these fail. But the farmer, by his permanence of location, and by his improving, instead of exhausting, the land, seemed the founder of a country's prosperity. It is true that, in some instances, particularly where subjected to a heavy drain upon its mineral constituents by successive crops of cereals or tobacco, land became exhausted. Modern science, with improved systems of fertilizing and prescription of rotation of crops, endeavored, with much success, to overcome this trouble.

The agriculturist was thus advanced in his efforts by the chemist, and took a step forward toward a more scientific treatment of his materials. Coincident with, or a little in advance of, this epoch, the mechanical inventor appeared on the scene, and invented machinery which enabled horses to do the work of men. From the reaping hook to the cradle was an important step. It multiplied greatly the labor of a man. From the cradle to the reaper, from the pitchfork to the unloading machinery, from hand labor to the self-binder, from the flail to the thrashing machine, were still greater ones, as they did away with directly applied human labor. These inventions mark a revolution in farming.

The farmer or his laborers to-day do not one hundredth of the actual work. Steam or horse driven machinery are the agents. The farm is converted into a factory. Grain is sowed and fertilizers are distributed by machines. Improved cultivators are used in treating growing crops. After harvesting by power, thrashing machines are substituted for the old time flails. The farming of fifty years ago is becoming a lost art.

To a great extent, the farmer is deposed from his position as the principal producer of a region's wealth. This honor must be shared by others. The chemist has had his part in the change, but the inventor stands above all in this. To him the new condition is principally due. As the result of his work, the United States maintain numerous factories devoted entirely to the production of agricultural machinery. Every city and village have stores devoted to their sale. The farmer directs the operations of the machinery when completed, just as the engineer of a steamer superintends the running of the engine. It would be as truthful or logical to call the marine engineer the developer of commerce as to claim for the farmer the title of sole producer. In his work he has partners. Without the great agricultural implement works, he could do nothing. They, as well as he, are agents in production. The inventor who directs and plans the factories' work is also a partner, and is an actual producer. He may not make two blades of grass grow where formerly there was only one, but he has changed another ratio for the better. He has made the actual labor of a man far more efficient than before. The soil may produce no more, but the labor of those tilling it is many times more productive.

The future political economist should pay regard to the new order of things. The influence of the inventor has been particularly great in the field of agriculture. It has done away with the customs of many centuries; it has converted the farmer into a superintendent or engineer, and raised him from the despondency due to unending toil.

The immense grain farms of the West are the outcome of such factors. Steam and horses are the motive power, and improved machinery is the direct performer of the work. The system by which they are run could no more exist without the inventor's aid than the merchant navy could be profitably worked without compound engines and all the latest devices and inventions in steam machinery. The same applies to the smaller farms of the East. On them the work is done by machinery, and the farmer is being educated and developed into an engineer, capable of running and repairing complicated machines.