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1905: A RETROSPECT.

In many respects the year 1905 was a period of great achievement in Engineering. Enterprises were started in Canada, which are viewed by her people with pardonable pride: the great water-power development at the Horseshoe Falls, Niagara, for supplying electricity to distant Toronto and other cities; the Quebec bridge, which, when completed, will be the largest single span cantilever structure in the world; the trans-continental Grand Trunk Pacific Railway, for opening up the wide prairie lands of the North-west to the blessings of civilization; the fine rolling mill at Sydney, Cape Breton, for supplying Canadian railways with home-made steel rails; and the experimental electric furnace, ore smelting plant, installed by the Canadian Government at Sault Ste. Marie, for the purpose of proving the possibility of reducing the refractory iron ores of the Dominion. These, and other important works of Canadian Engineers, have made memorable the year just ended. When we look out of ourselves over the mechanical world, we see footprints and marks everywhere, of a great commercial struggle between steam, gas, electricity, and oil, for supremacy as a motive power. It is 207 years since James Watt invented the reciprocating steam engine, the practical application of which—on both land and sea—has done more to accelerate progress and civilization than any other material agency of man. Nine years ago, when we compared a modern quadruple expansion, marine type, reciprocating steam engine, with its perfection of design and finish, and economy in steam consumption, side by side with the rudely designed and roughly constructed engines of the Watt period, we were filled with admiration at the progress made in constructive Engineering, and it seemed that finality had just about been reached in the application of steam as a motive power. In 1897, however, as the battle-ships of Great Britain lay off Spithead, in two lines five miles long, celebrating the jubilee of Queen Victoria, the representatives of all nations were startled to see a small steam launch—the "Turbinia"—dash before their eyes between the two lines of ships, at a terrific speed (32¾ knots)—the like of which had never been seen on water before. That was the first popular demonstration of the Parsons turbine. Astonishing progress has been made since then. It is estimated that there is now about 700,000 indicated horse power of marine turbine machinery built or being built. Orders have been issued by the Admiralty for its adoption throughout the British navy; and a similar course would doubtless have been taken by the U. S. Navy, had the contemplated action not been checkmated by the gross misrepresentations of a powerful German syndicate; an incident which stands out as one of the greatest commercial scandals of 1905. The last month of the old year witnessed the complete triumph of the steam turbine on the leviathan Cunarder, the R.M.S. "Carmania," which sailed from New York, December 16th on her second voyage, having on board our special correspondent, Mr. C. H. Mitchell—who is to record his impressions in our February issue. The "Carmania" has proved that the steam turbine is an ideal prime mover for ocean vessels of even the largest size. The passing of the reciprocating steam engine for marine propulsion, is, therefore, only a matter of time. But the old year has not rendered a like verdict in the case of the stationary land engine; for although the steam turbine has proved its suitability as a prime mover in electric lighting plants of magnitude, etc., there are fields where the reciprocating type of steam engine will hold its own for many a long day; in huge rolling mills for example, where the rolling of heavy steel slabs and blooms demands an enormous sudden torque, or turning effort. No steam turbine yet designed can be governed to meet this severe, erratic work. And since Professor Rateau, of Paris—by his invention of the low-pressure turbine generator—has made it possible to utilize the exhaust steam from reciprocating engines, converting the rejected heat into useful electrical power, it is certain that costly first-class, reciprocating engines, in plants of magnitude, will not—on the score of economy—be suddenly torn out, and steam turbines substituted in place thereof.

Another phase of Engineering that showed a marked advance during the year, was the gas engine business; due not to the invention of any new type, but largely to the introduction of individual suction gas producer plants, by which a still further economy in fuel consumption has been effected; the comparative efficiency of this system as against the best reciprocating steam engine practice being 2 to 1. The installation of suction gas producer engine plants is destined to become very popular—especially for low powers. Perhaps the most formidable rival to the gas engine