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THE NEW WORKS OF SCIENCE.

As the proud nineteenth century draws to a close it would seem that its representatives have good reason to be proud of the legacy to be left by them to succeeding ages. The last century saw the infancy of the steam engine, saw the isolation of oxygen gas and of a few other substances in the field of chemistry, and that is nearly all in science given to the present age by its predecessor. Before 1800 the cities of the world were still lighted by lamps and candles; electricity had its highest development in the inefficient frictional electric machines; railroads and steamboats were not yet a factor in transportation, and even the roads of England had but begun to be made; the adage that there is nothing new under the sun applied with full force to the few achievements in science of the world one hundred years ago.

Then the nineteenth century commenced. Gas lighting was introduced and the nocturnal crimes of great cities almost ceased. Lavoisier's and Priestley's discovery of oxygen began to bear fruit, and modern chemistry, which is a little over a century old, gradually took a position in the world of science. The galvanic battery gave strong current electricity, Sir Humphry Davy produced the electric light and the metals of the alkalies; the steamboat, locomotive and telegraph came into existence, and for a time it seemed as if man had all he could attend to in developing the new discoveries. Faraday's investigations led to the invention of the magneto generator; slowly the idea of a self-exciting dynamo was developed, and slowly enough the world awoke to the idea that the old prophecy of Goethe, that electricity only applied to the smaller business of life, might be falsified. Then, just as the use of currents of electricity of engineering dimensions was being developed, the almost imperceptible but delicately governed induced current was made to produce the transmission of speech; so that now, in our utilization of the thousand horse power units of electricity for engineering work, and of the minute, almost absolute units for telephonic work, we seem equally to avail ourselves of the colossal and of the microscopic powers, of electricity.

The assertion of the progress in science of this century is not needed, and a year ago it would have seemed trite enough to have exalted its achievements. But now, within a few years of the new century, and all within the space of a few months, developments and discoveries, few in number, but of importance enough and wonderful enough to fairly overthrow all our ideas of the limitations of man's power, have been thrust upon us.

The subject of the liquefaction of gases has long been a fascinating one for the physicist and experimenter. Chlorine and carbon dioxide were among the first, a number of years ago, to succumb to pressure, and after awhile scientists established two classes of gases, the fixed and the liquefiable gases. This division no longer exists. All the elemental gases have been liquefied, and the apparatus has been so perfected that with comparatively simple appliances, and in a space of ten minutes, liquid air can be collected like water in an open vessel, and the assertion has been made within a few months, by one of the best qualified investigators of the world, that in the near future liquid air will probably be the great source of artificial cold. Even more wonderful is the liquefaction of air produced by the cold due to its own expansion, which has been accomplished recently on what may be termed the commercial scale. We may within a few years see liquid air supplied and used by the liter like any common chemical.

The old time gas engineer produced hydrocarbon gases from hydrocarbons prepared in preceding geologic ages by the mighty forces of nature working through the quiet agency of the profuse plant life of the carboniferous and other eras. The dreams of the advanced technologist, who recognized the crudeness of the coal gas and water gas processes, the latter seeming but slightly an advance over its predecessor, would sometimes take the shape of the future synthesis or direct combination of carbon and hydrogen. If this could be done on the large scale, gas making would stand upon a new and scientific footing. The later triumphs of chemistry are largely in this field of synthesis, and now, in the direct production on the large scale of a hydrocarbon, chemistry has distanced its greatest achievements of the past as far as the technical field is concerned. Acetylene will always remain one of the milestones of the world's progress. Its production is due to the development of the dynamo—it is a gift made by physics to its sister science, chemistry.

The analysis of air was early attempted, and has been made so often that it seemed as if its composition was settled forever. It was always treated as of fixed composition, no variation being found in it wherever collected, unless artificially contaminated. But within a few months the world of science was startled to hear that an element hitherto undiscovered was a constituent of air, and that its composition had never been correctly determined; the new analysis showed the existence in air of the strange neutral element, argon. Argon and acetylene represent triumphs of the opposite branches of chemistry—of analysis and of synthesis respectively.

And now the world is electrified over a new discovery exemplified by the reproduction of an image of an object through opaque screens by hitherto unknown rays—we allude to Roentgen's discovery of X ray photography. Science had accepted the undulatory theory of light; it had, by referring light phenomena to wave motion of the luminiferous ether, accounted for all the actions of light, a mathematical explanation of refraction and reflection had been reached, and the undulatory theory of light seemed to include actinism or photography. Since the beginning of the present year the epoch making work of Roentgen has been published, and it presents no greater degree of achievement than it does of mystification as it affects the theory of light.

No age has ever witnessed such a succession of triumphs of science in so short a time. The effect of the cumulated wonders is to prepare us for any revelation of science—to almost dangerously increase our powers of belief. They make it harder than ever to discern and fix the true limits of natural science. To the working scientist, the discoveries are an inspiration, for they show him that the extreme elevation of universal knowledge has not yet been reached; he still has heights of discovery to climb, of altitude unimagined seriously by the world of but a decade ago. The synthesis of carbon and hydrogen, the liquefaction of air and hydrogen, the discovery of argon, and the discovery of X ray photography, will add new luster to the names connected with the work. Rayleigh, Ramsay, Dewar, and Roentgen among the pure scientists, and Wilson and Linde among the technologists, will have their fame increased by the renown which their achievements will impart to the expiring nineteenth century.

THE PUBLIC ART LEAGUE OF THE UNITED STATES.

We are in receipt of a copy of the constitution of this league, which has been formed "to promote the passage of a law, or laws, by Congress, requiring that before purchase or adoption by the government of any work of art (sculpture, painting, architecture, landscape design, coin, seal, medal, note, stamp, or bond), the design or model for the same shall be submitted to a commission of experts for an expression of opinion as to its artistic merit; and that the approval of such committee shall be a prerequisite to its adoption."

Richard Watson Gilder, editor of the Century Magazine, New York, is the president, and the list of officers and directors contains some of the most famous names in letters and art in America. We notice among others those of Augustus St. Gaudens, W. M. Chase, Joseph Jefferson, D. H. Burnham, Mrs. M. S. Van Rensselaer, and Charles Dudley Warner.

The object of this league is a distinctly patriotic one, and it should commend itself to all those who have the artistic reputation of their country at heart. The public buildings which are erected by the government of a country, the statues which grace its parks, the parks themselves, the various works of art that fill its museums, and the very designs which are impressed upon all government seals and official documents, are taken by the world at large as representing the best artistic possibilities of the nation.

As a matter of fact, however, it cannot be said that in every case our public works, of the kind enumerated above, do justly express the artistic sense of the American people. Although we have many monuments of art of which any nation might be proud, it is undeniable that others are in existence, and some of them in "high places," which would never have been erected if their design had been first submitted to such a board of experts as the Public Art League is seeking to have established.

According to Article IV of the constitution, persons may become members of the league by authorizing the secretary to sign their names to the constitution. Names should be sent to Mr. Glenn Brown, acting secretary, National Union Building, Washington, D. C.

The Use of Horseflesh in Paris.

The statistical bulletin of the French Ministry of Agriculture, dealing with the consumption of horseflesh in Paris last year, gives the number of horses killed for consumption as food at 23,186, this being exclusive of 43 mules and 383 donkeys. The total weight of meat sold was 5,130 tons, and this was sold at 186 shops or stalls, which are not allowed to sell any other kind of meat. The maximum price ranged from 18 cents a pound for the fillet to 4 cents a pound for the necks and lower ribs. The report adds that not more than a third of the meat is sold at the stalls, the remainder going to make sausages.

THE total salmon pack of the Pacific coast during last year, for the full spring and fall seasons, was 2,034,877 cases. Of this amount 627,000 cases were packed on the Columbia River, 637,000 cases in Alaska, and 512,877 cases in British Columbia.