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A COMETARY RETROSPECT.

From recent calculations of the elements of Coggia's comet by Mr. Plummer, an English astronomer, there appears to be a close similarity between them and those of Comet II of 1737. There is a sufficient correspondence, it seems, to warrant the belief that the two comets are identical, and that we are receiving a second visit from the vagrant body which attracted the notice of the astronomers of a hundred and thirty-seven years ago. We find no record of its being a very prominent object, although it appears to have been observed in many of the great cities of Europe. Nor do we find statements of any peculiar phenomena connected with its appearance.

There will doubtless be many who, in gazing at the comet night after night as it gradually augments in brilliancy, will ponder as we have over the vast progress which the world has made since the era of the former visitation.

Locking at the condition of Science in 1737, from our present standpoint, it is easier to regard the circumstances negatively, to imagine our own condition if deprived of the re sults of discovery and of progress which have accumulated in the intervening years. The spot, on which the building in which we now are stands, was then but a green meadow. The crowded metropolis was existing only in the germ, and that merely a few straggling streets close to the water's edge. George II. was on the throne of England, and Louis XV. on that of France. Both amiable sovereigns were struggling to monopolize as much of North America as possible ; and although at the time peace reigned in the colonies, it was but a temporary one, which ended in still fiercer hostilities seven years later. Sir Isaac Newton had been dead for six years, and the mathematicians of England were arrayed against those of the continent, squabbling and bick ering, with an acrimony intensified by international jealousy, over the theory of gravitation. Newton had studied out the subject of electrici'y and had invented the glass globe machine. Steph n Gray had also made some investigations, but no one had ventured a theory, nor had an application of the new phenom na been suggested. Telegraphy, the galvanic battery, the innumerable inventions based thereon, were all things of the future. There were plenty of alchemists in Europe, and the science of chemistry was just wrenching itself free from connection with their chimerical fancies. Stahl had but recently announced his theory of philogiston, a substance which Cavendish in subsequent discoveries believed identical with hydrogen. But the transition period in chemical science was yet nearly forty years distant. Priestley, the discoverer of oxygen, was but an infant. Black, the investigator of the alkalies, and Scheele, the inventor of modern organic analysis, were likewise children. Out of the sixty-three elements, but fifteen were known. Aluminum, chlorine,oxygen, hydrogen, nitrogen, platinum, and nickel were among those which had never been recognized. Newcomen's steam engine was used in the mining dis-

denser valves, had not been struck with the brilliant idea of making catches and strings perform the labor in his stead. The Marquis of Worcester and James Watt were unknown to fame. The first railroads were in use in the coal districts of Northumberland and Durham, but the rails were nothing more than wooden beams, and iron was not to be substituted for them for thirty years. In the blast furnaces wooden bellows were in use. Puddling,rolling,and the hot blast were unknown. In Europe cast steel had never been made, and but a short time had elapsed since the publication of Réaumur's work, making known the process of manufacturing ordinary steel. In this country Jonah Higby's patent, obtained from the Connecticut legislature, for a "curious art to transmit common iron into good steel" had just run its term of ten years. Having no autonomy as a nation, we had no patent right system in those days, and even civilized France had mace to effort toward establishing one. The arts of photography or sun painting in any form were undreamed of. The sciences of aeronautics and of agricultural chemistry had never been imagined. Surgeons hacked off the limbs of their victims and seared the flesh with red hot irons, regardless of the agony they inflicted, for anæsthetics were unknown. The phenomena of digestion were but little under stood, and quinine, with hundreds of other remedies now common, had not been discovered.

Whale oil was burned in the lamps, which formed the sole means of illumination when candles were absent. Petroleum, paraffin, and illuminating gas were yet to be found. In artillery and implements of war, the bayonet had just superseded the pike, the flint lock musket was just coming into use, while a single monster cannon of the present day would have dispersed whole regiments armed with the prim itive artillery then employed.

Laplace had not given his labors to the world. Saturn's rings and satellites had not been discovered, and the path of that planet was supposed to be the outer bound of our solar system. The spectroscope had made none of its wonderful revelations, and the distances of the fixed stars, their ap-, parent motions, and the fact of their being suns and centers of other systems, the 5,700 nebulæ, and the 136 asteroids, all were unknown.

India rubber had been discovered one year. There was no definite system of botany, and Cuvier's researches in natural history had not appeared. The caloric engine, the hydraulic press and ram, the sewing machine, and the diving bell had never been thought of. Blowpipe analysis and the atomic theory, a system of logarithms, calico printing, the steam printing press, all were yet to be invented. No one had deciphered the inscriptions on the monuments of Egypt. Jenner had not introduced vaccination, nor Hahnemann homeeopathy as a school of medicine. Steam navigation and the screw propeller were yet to appear. Captain Cook was making his celebrated voysges around the world. Immense portions of Australia, of Africa, of the polar regions, had never been visited by civilized races. Anthracite coal had never been burned, nor the powerful explosives now known to Science used to tear rocks asunder. Dentistry was unknown as a profession on this side of the Atlantic, and artificial teeth had not been invented. The first chronometer had not been completed. The pianoforte was a new-fangled invention, which no one would have aught to do with until his Majesty Frederick the Great of Prussia deigned to buy one ten years later. Polarized light had not been discovered. No post office system had been developed by any government, nor had any improved means of teaching the deaf and dumb been adopted. Steel pens were unknown, and the SCIENTI-FIC AMERICAN was not one of the seven newspapers then existing in North America.

Our retrospect already extends beyond intended limits, and we have far from even summarized the great discoveries of the past century and a half. That our descendants will surpass us as much as we do our ancestors is within every bound of probability. When our celestial visitor again appears, as it will in the year 2011, it will reveal itself to the gaze of earthly inhabitants, regarding the magnitude of whose knowledge and whose powers it would be idle even to speculate.

TAXING POWER OF THE LEGISLATURE.

Law, in its true sense, is the product of the highest reason coupled with the most exact justice. The Civil or Roman Law and the Common Law of England are to be admired as The great deviations modela convine law are to be found in arbitrary acts of our State Legislatures, seriously affecting the rights, liberties, and property of individuals, and the tendency of the courts to give validity to such acts in contravention of constitutional guaranties and those of the common law. The most notable instance of this may be found in such legislative acts as provide for the disbursement of large sums of money in making public improvements, and then charging the whole cost as a tax on specific individual property without the consent of the owners, and, as has sometimes happened, to the entire confiscation of the property. The power of the legislature to do this, and to act as the final judge on the propriety of any public improvement, from which the individual has no redress, although ruined thereby, is now, as we understand the law. laid down by the Court of Appeals of the State of New York. This doctrine is so arbitrary in form and so destructive of individual rights that it becomes a relief to know that our sister State of New Jersey, through Chief Justice Beasley, of its Court of Errors and Appeals, lays down a much mild er and wiser rule for that State, in a recent decision made been the attempts made, extending over a period of twenty-

tricts, and the boy, who sat beside it and worked the con- by him at the suit of "The Mayor and Common Council of Newark ads. The State, Agens et al.

The facts were that a certain street in Newark had been repaired under an act of the legislature which provided that two thirds of the cost should be imposed on the owners of lots fronting on the line of the improvement, and one third on the city treasury; and the question was whether the legislature could fix, at its mere will, the ratio of expense to be put upon the owners of the property along the line of the improvement. The following is an extract from the very able opinion of the Chief Justice, fully concurred in by his associates, and well worthy the attention of the courts of this and other States:

"* * * That the effect of such laws may not extend beyond certain prescribed limits is perfectly indisputable. It is upon this principle that taxes, raised in counties, towns, and cities, are vindicated. But while it is thus clear that the burthens of a particular tax may be placed exclusively on any political district to whose benefit such tax is to enure, it seems to me it is equally clear that, when such burthen is sought to be imposed on particular lands, not in themselves constituting a political subdivision of the State, we at once approach the line which is the boundary between acts of taxation and acts of confiscation. I think it impossible to assert, with the least show of reason, that the legislative right to select the subject of taxation is rot a limited right. For it would seem much more in accordance with correct theory to maintain that the power of selection of the property to be taxed cannot be contracted to narrow-er bounds than the political district within which it is to op-erate, than that such power is entirely illimitable.

If such prerogative has no trammel or circumscription, then it follows that the entire burthen of one of these public improvements can be placed by the force of the legislative will on the property of a few enumerated citizens, or even on that of a single citizen. In a government in which the legislative power is not omnipotent, and in which it is a fundamental axiom that private property cannot be taken without just compensation, the existence of an unlimited right in the law-making power to concentrate the burthen of a tax upon specified property does not exist. If a statute should direct a certain street in a city to be paved, and the expense of such paving to be assessed on the houses standing at the four corners of such street, this would not be an act of taxation, and it is presumed that no one would assert it to be such. If this cannot be maintained, then it follows that it is conceded that the legislative power in question is not completely arbitrary. It has its limits, and the only in-quiry is where that limit is to be placed. * * *

So far as the particularized property is specially benefited, an exaction to that extent will not be a cond mnation of property to the public use, because an equivalent is returned, and this is the ground on which the abnormal burthen put upon the land owner is justified. Speaking on this subject, Chief Justice Green says : 'The

theory upon which such assessments are sustained, as a legi-timate exercise of the taxing power, is that the party assessed is locally and peculiarly benefited, over and above the ordinary benefit which, as one of the community, he receives in all public improvements, to the precise extent of the assessment." ("State v. City of Newark, 3 Dutch. 190.) It follows, then, that these local assessments are justifiable on the ground alone that the locality is especially to be benefited by the out-lay of the money to be raised. Unless this is the case, no reason can be assigned why the tax is not general. An as sessment laid on property along a city street for an improve-ment made in another street in a distant part of the same city would be universally condemned, both on moral and legal grounds. And yet there is no difference between such an extortion and the requisition upon a land owner to pay for a public improvement over and above the exceptive benefit received by him. It is true that the power of taxing is one of the high and indispensable prerogatives of the government, and it can be only in cases free from all doubt that its exercise can be declared by the courts to be illegal. But such a case, if it can ever arise, is certainly presented when property is specified out of which a public improvement is to be paid for, in excess of the value specially imparted to it by such improve-ment. As to such excess, I cannot distinguish an act exacting its payment from the exercise of the power of eminent domain. In case of taxation the citizen pays his quota of the common burthen; when his land is sequestered for the public use, he contributes more than such quota; and this is the distinction between the effect of the exercise of the taxing power and that of eminent domain. when, then, the overplus beyond benefits from these local improvements is laid upon a few landowners, such citizens, with respect to such surplus, are required to defray more than their share of the public outlay, and the coercive act is not within the proper scope of the power to tax. And as it does not seem practicable to define the area upon which a tax can be legitimately laid, and beyond which it cannot be legitimately extended, and as there is, as has been shown, necessarily a limit to the power of se lection in such instances, the principle stated in the case cited is, perhaps, the only one that can be devised whereby to graduate the power. Consequently, when the improvement, as in the present instance, is primarily for the public welfare, and is only incidentally for the benefit of the landowner, the rule thus established ought to be rigidly applied and ad-

hered to." A full review of this able decision and the cases it cites would interest and instruct all lovers of sound law. It im. parts the good old doctrine that States and Legislatures are only the product of an aggregate of individuals, created alike for the general and individual good, and not to be the means of oppression or extortion of the highest or the most weak and humble citizen.

RECENT PRINTING PRESS IMPROVEMENTS.

In the working of nearly all printing presses the sheets of paper are supplied by hand, the workman being known as a "feeder." Each sheet must be taken up singly and exactly placed on the feed board, where it can be seized by the press nippers at the proper moment, and carried to the types. Any carelessness on the part of the feeder results in bad printing and the spoiling of sheets. Measured by the manual force expended, the feeder's labor is slight; but no press can be run, not even for the smallest job, unless the feeder is on hand to place the sheets, while his inexorable weekly wages are a serious expense in every printing office. Many have