pendicular pipe, or any length of horizontal hose or pipe. The stream seems to possess the wonderful property of clearing a room of smoke almost instantly, though filled to suffocation. The gas also seems to interpose a wall of non conducting vapor between the hoseman and the fire, which protects him from the heat. In fact, experience is developing every day new advantages for this system.

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Contents.

(Illustrated articles are marked with an asterisk.)

HONOR TO WHOM HONOR IS DUE.

There is a large figure on a house in Center Street, New York city, which at most hours of the day may be seen vigorously engaged in turning a crank. Pedestrians on the street jostle each other while vainly trying to make out what the wooden man is about, and passengers in the cars stretch their necks to obtain a clearer view. The residents of that locality seem to take it as a matter of course and attend to their affairs as if nothing uncommon was going on; but the mystery still remains unsolved. We have caused an investigation to be made and have learned that, instead of the man turning the crank, it is the crank that turns the man. And upon this fact we wish to found a few practical observations. The sturdy figure, making itself very conspicuous before the world and attracting all the notice it can, may stand for the lucky appropriator of other men's discoveries. It very frequently happens that the man who discovered the principle upon which an invention is founded, and which is, in fact, the engine that moves the whole apparatus, is forgotten; but the noisy speculator who runs about the streets and gets up stock companies and makes a fortune, and, in the minds of many persons, is entitled to all the glory, is really little more than the lay figure moved, by an invisible crank, by a power discovered after years of toil and study by some unknown and forgotten personage. The man who reaps the fame and money is turned by the crank which, in his conceit, he fancies he moves himself. Giving honor to whom honor is due is a very rare occurrence. Mankind looks at results and cares very little for the secret springs that have proved the fountain head of success. There is nothing so successful as success; and under the glow of triumph and the applause of men, the money maker accepts the public testimonials, goes to all the grand dinners, has his portrait painted for some public institution, and finally claims the whole credit of a grand enterprise. There is no doubt that the men who furnish the capital and push inventions to practical use are entitled to a fair share of credit for what they have done; but they cannot be accused of unselfishness in the matter or of acting upon purely patriotic motives. "Rich fields and pastures new" are all that this class of persons demand; and if the dividends are all right, they ought to keep quiet. What shall we say for the silent worker who discovers a great principle from which springs a grand progeny of inventions? The misfortune is that we frequently lose sight of such a benefactor. Just as the sources of the Nile are hardly yet known to the world, while in the plains it becomes a grand river and flows through numerous mouths into the sea, so with the fountain head of discoveries: we often fail to trace the precise source, but in the results we have a mighty river of applications, known to the whole world. The rill which has its rise among the snows and rocks of the mountains finally flows quietly past smiling meadows and the haunts of men; and while it sings its pastoral, we forget the ice and snow and beetling crags whence it had its origin.

Professor Tyndall in his eloquent plea for original research has in mind the devoted band of workers who, in poverty and reproach, in the chill atmosphere of neglect, often amidst persecutions and opposition, have made the discoveries which are the pride and boast of our present civilization. He cautioned us to protect and foster all such persons, and he proved the sincerity of his motives and the strength of his interest by leaving in the hands of trustees all the net earnings of his laborious lecturing tour in the United States, for the support of needy students who wish to devote themselves to pure science.

Any one who is willing to accept a career of this kind must be imbued with the true missionary spirit and not be actuated by anticipations of reward or desire for fame. Sooner or later, true honor may be accorded to the person to whom it is due; but this is rather the exception than the rule, and he who keeps public opinion before him as the spring for action will ask for bread and receive a stone. It is rare indeed that any great discovery has been made when sought with a view to immediate practical results. Nearly all of the grand principles upon which are based the leading applications of the age were discovered and worked out by men who never thought for a moment of the possibility of applying them. It would almost appear to be with original discovery as with humility: the moment it looks upon itself, it is gone. Let us glance at a few of the leading discoveries of modern times, and see if this statement be not true.

The doctrine of the correlation of forces—that force is not lost any more than matter—which in its importance is not inferior to the discovery of the law of gravitation, was first enunciated in a modest paper by Dr. Mayer, a practising physician in a small city in Germany. He could not possibly have foreseen the results that are likely to grow out of this law. Newton's analysis of solar light, Volta's battery and Oersted's electro-magnetism are further illustrations of discoveries which have grown out of a search for truth and not for fame. Although scientific writers have given due credit to these illustrious men, it cannot be denied that those who have made the applications have run away with popular favor and have gained all the prosperity. The great engines, propelled by the forces which were made known to us by Newton, Volta, Oersted and many others, keep in motion the crank that turns the busybodies of the world, and gives them a name for enterprise which they scarcely deserve. It would aid very much if the real benefactors could have due credit in their lifetime. There is little else that they desire, and sympathy and praise costs nothing, while it is often rich in the fruit that it may help to bring to maturity.

Professor Tyndall has set us a noble example of unselfish liberality. He had every right to carry with him to his home all the money that had been cheerfully given by those who were instructed and enchanted by his lectures; but instead of doing, so he prefers to hand it back for the benefit of those who gave it, and in aid of the common cause of scientific learning in which the whole world takes an interest. This is an example worthy of imitation. The trustees who have charge of the Tyndall fund will no doubt be glad to have the amount increased as largely as our wealthy citizens may desire. They cannot have too much money for the promotion of original research, and it is equally certain that no investigation founded upon correct scientific reasoning can be made in vain. Let us start as many rills of discovery as we can, knowing full well that they will swell to torrents and ultimately flow gently through the valleys until they empty into the common ocean of human wants. And we must not forget that every grand result had its origin in some apparently insignificant fact, which, by accretions and accumulations, becomes important and finally culminates in a successful application. Keep the fountains of discovery pure and bright, give honor to those who deserve it, and the streams of knowledge will not dry up and the world will not want for inventions.

A NOVEL TRACTION ENGINE FOR RAPID TRANSIT.

The interest, with which all plans leading to the accomplishment of a suitable system of rapid transit in this and other large cities is regarded, has been the means of calling forth many inventions designed to meet the existing need. An engraving of a novel apparatus of this class was published in the SCIENTIFIC AMERICAN on page 118 of our last volume, under the heading of "Lamm's Fireless Locomotive." One of these novel locomotives has lately been put in practical operation in our neighboring city of Brooklyn, with very flattering and interesting results.

The machine consists of a strongly made cylindrical reservoir, enclosed in a very thick clothing of felt and other material to prevent loss of heat by radiation. Connected with the reservoir is a steam engine which actuates the axle of the driving wheels. Before starting the reservoir is charged with very highly heated water from a stationary steam boiler, the heat being such that a high steam pressure is generated in the reservoir. As this pressure is relieved by the exit of the steam into the engine, a portion of the water in the reservoir is converted into steam by the heat with which it is surcharged. This conversion, continues until the temperature of the water falls to 212°, and the machine can therefore be operated during the interval until nearly that point is reached.

The experiments, which we witnessed, consisted in charging the reservoir of the machine with hot water having a temperature of 360°, which yielded a steam pressure of 145 pounds per square inch, and then running the locomotive for a distance of six miles, on the track of the Coney Island Railway. During the first half of the journey, which was accomplished in 15 minutes, the pressure fell to 90 pounds; and at the expiration of the trip, which occupied 33 minutes, the gage showed but 65 pounds, the rate of diminution being much more rapid under high pressure than when the same had become lowered. The speed attained was twelve miles per hour, the burden being a single six ton car for 35 passengers; we were assured, however, that the same time had been made with two carriages containing seventy persons. In actual use it is proposed to locate, at the termini or other points of the line, a sufficient number of stationary boilers from which the locomotive may be charged or its power renewed when exhausted.

From the results of the trials and those that have been deduced from the successful operation of the device in New Orleans and elsewhere, we are inclined to think the invention one of considerable utility. It is perfectly safe, because the steam pressure can never increase but is always steadily lowering. Being without a fire, it is free from many of the defects of the dummy. Of course there is no smoke, while the noise of the exhaust is scarcely perceptible. Its speed and tractile power are, as practically proved, sufficient for ordinary purposes; the cost of construction is not great, and as regards economy, its use can probably be made less costly than that of horses. We noted especially that the motion was regular and easily governed or stopped by the engineer, and that the radiation of heat, which, it might be imagined, would rapidly take place from the reservoir in cold weather, was almost completely prevented by the thick surrounding casings. We are of opinion that the invention is worthy of thorough investigation from parties interested in street railroads. We should think it well adapted for the elevated railroad on Greenwich Street, New York, and for transferring freight from the steam terminus of the Hudson River and New York and New Haven railroads at 42d street down to their freight stations in the heart of the city; while for the underground railway lately organized in Brooklyn, and for the Broadway underground railway in this city, it may prove to be "just the thing."

EXPLOSIONS PRODUCED BY HIGH MUSICAL TONES.

The greater number of explosive agents contain nitrogen, which retains, with a very weak affinity, the element required for the combustion of the other ingredients; it resembles a spring which, when once set free, unwinds itself totally and suddenly. The starting of this spring is, in the case of gunpowder, gun cotton, etc., the heat-giving spark; with percussion powders, nitro-glycerin, etc., simply a shock is sufficient, while it has been discovered recently that there are substances which can be exploded by merely a sound of high pitch; such is the iodide of imidogen, easily made by placing pulverized iodine in liquid ammonia. In order to explain the reaction, we will state that there are three compounds of nitrogen and hydrogen: NH_3, ammonia, NH_2, amidogen, and N H, imidogen. The two latter are only formed in combination when one or two atoms of hydrogen are displaced by a third substance; so, when placing iodine in ammonia, two atoms of hydrogen combine with the iodine to form hydro-iodic acid, which dissolves a portion of iodine, forming a brown solution; while another portion of the iodine combines with the remaining N H, in which two atoms of H are displaced by iodine, and NH_3 becomes NHI_2; this forms a black powder, which is left as residue; when, after 15 minutes reaction, the brown liquid ammonia solution is poured off. The deposit is then filtered to free it from excess of ammonia; and, while wet, the filtering paper is divided into small pieces and dried separately, in order that any accidental explosion may not involve the whole mass.

There are other methods of making this compound. According to Mitscherlich, the iodine is dissolved in *aqua regia* and precipitated with an excess of ammonia, by which operation all the iodine is changed into NHI_2. According to Serullas, a saturated solution of iodine in alcohol is mixed with an excess of ammonia; then water is added, as long as it produces a precipitation of a black powder, which is again NHI_2. In this last form of preparation it is less explosive and less dangerous; while, if prepared by one of the former methods, the least pressure or friction causes the dry powder to explode, and it is a laboratory trick to distribute small particles of it while wet, on the floor of a room or hall; if, after drying, the people walk over it, a fusillade of small explosions is heard from under their feet.

The experiments to explode such powders by the rapid vibration of a high musical tone, were recently made by Champion and Pellet, and we have described them on page 20 of this volume. They form a valuable addition to the lecture room experiments.

The bromide of imidogen, produced by pouring bromine into ammonia, explodes much more easily, and, even at a distance, by any sharp noise; it is much more dangerous than the former. But the chloride of imidogen, produced by passing chlorine gas through liquid ammonia, is a liquid oily substance, and perhaps the most dangerous combination in existence. A single drop will explode most violently, on being merely touched with a greasy solid body. Berzelius gives a list of the bodies, upon the mere contact with which this formidable compound explodes. Undoubtedly it will go off by the vibration of the air produced by tones, but experments in this direction are still wanting.

POWER RAILWAY BRAKES.

The Honorable Mr. King lately introduced in the House of Representatives a bill to compel all railway companies to provide their cars with power brakes, so arranged that the engineer may, at any moment, apply power to the wheels of every car on the train. Penalties are provided against companies who fail to employ the device mentioned. The introduction of the bill was followed by an interesting speech by Mr. King, who presented many useful facts concerning railways, and railway brakes in particular, from which we take the following:

"Power brakes, operated from the locomotive, are a very old invention, although they were never adopted by any railroad company in the United States until about three or four years ago.

The Creamer brake is operated by the engineer, in case only of an emergency, by pulling a cord extending the whole

length of the train. This releases the brakes, which are wound up after the fashion of an alarm clock. The hand brakes are used at all ordinary stoppings, the spring power being reserved only for an emergency.

The electric brake of Olmstead has been in use upon one train on the Erie railroad for some time, and works well.

The steam brake has a continuous line of pipe from the locomotive to the last car in the train; under the center of every car is a common steam-tight cylinder and piston; a branch from the long line of pipe communicates with the front end of all these cylinders; so that when the engineer turns a stopcock, the steam rushes like lightning through the train, enters the cylinders, and pushes the pistons outward, and thus applies the brakes to the wheels of every car in the rain. The air brake is the same thing, except that air does the work instead of steam.

To show the state of the art, and that the material exists by which this bill can be carried into effect, tables are appended to these remarks showing the names of inventors and the dates of their patents obtained both in England and the United States. The first power brake patent granted in this country was in 1847, and the total number granted up to the close of last year was fifty-nine. More patents on power brakes were granted in 1872 than from the organization of our Patent Office to the close of 1871, which strikingly illustrates the rivalry of the inventive genius of this country.

In England, from 1840 to 1866, there were patented twenty-two electric brakes; from 1835 to 1865, twenty hydrostatic brakes; thirty pneumatic brakes from 1838 to 1866, and fifty-four steam brakes from the year 1836 to 1866.

Henry Miller's steam brake, patented in 1855, was tried on a train of cars at Detroit, about that year, in the presence of several distinguished people; and a very interesting printed report of its operation and trial at that time may be found in the file containing his original application for a patent in the United States. But, for the fruits of his genius developed almost twenty years ago, it is to be regretted that he never received either honor or competent reward.

Seven companies for the manufacture of power brakes have been organized in the United States since 1869. And of the 444 railroads in the United States and Canada, more than one sixth of them have already been equipped with power brakes operated by the engineers.

On the Chicago and Northwestern railroad, by means of these brakes, a train of six cars, going at the rate of thirty-two miles an hour, was stopped in 19 seconds; the sametrain, going forty miles an hour, was stopped in 18 seconds, in 370 feet, or in less than one half the length of this Capitol building. The time in which to stop is the all-important consideration. It surely would take three minutes to stop a train going at this speed with the ordinary hand brakes. A minute in railroading is a very important matter."

Mr. King is hardly correct here. With handbrakes, properly and promptly applied, the train can be stopped as quickly as by the power brake. At a speed of thirty-three miles an hour a train can be stopped by hand brakes within a distance of 57 yards. At a speed of sixty-three miles an hour, within a space of 273 yards.

COLLAPSE FROM LOW WATER IN STEAM BOILERS.

A correspondent writes from Phelps, N. Y. to tell us of a somewhat remarkable and very interesting instance of a peculiar effect which may follow the overheating of a steam boiler in consequence of a deficiency of water. The case furnishes us an excellent text for remarks on the subject of "low water." A copper still, which had been in use, was, by some oversight, completely emptied while the fire was allowed to burn with undiminished intensity. It, as a natural consequence, quickly became red hot. While in this condition a quantity of cold liquid was run into it, when it instantly collapsed, being completely crushed in by the pressure of the atmosphere acting upon its exterior.

Our correspondent asks us to explain this, to him, most mysterious occurrence. Probably a very large majority of our most experienced and most intelligent engineers, if asked what effect should be anticipated in such a case, would say that there would be imminent danger of an explosion, and that a collapse could not, under any circumstances, occur. This case, however, is described by one of our readers, who gives us his name, and we cannot doubt the authenticity of the narrative. We can readily imagine, furthermore, how such an action might take place. A closed vessel used as a still, having pipes of small diameter for inlet and outlet, would, when the contents were drained off in the manner described, be left dry, but filled with highly heated aqueous vapor at atmospheric pressure. When the cold liquid was allowed to re-enter, this vapor would be likely instantly to condense, and before the atmosphere could enter through the contracted openings in sufficient quantity to equilibrate the pressure on the exterior, collapse might occur. This we presume to have been the case in the instance considered, and we have here another reminder of the falsity of the idea, formerly so prevalent and which is by no means yet extirpated from the minds of some of even the most intelligent men having charge of steam boilers, that "low water" must inevitably produce an explosion, and even that it is the principal cause of explosions.

Sixty years ago a crucial experiment was unintentionally tried by the then well known Captain Bunker, who commanded John Stevens' steamboat, Phœnix, the craft which is celebrated as having been the first steam vessel to make a trip in the open sea. In the year 1812, just before the memorable trip from this port to Philadelphia, which the venturesome captain made with young Robert L. Stevens, the boat was lying one night at the wharf, when, by some carelessness, the boiler became completely emptied of water On discovering this unpleasant state of affairs, Captain Bunker at once, as he testifies in the report of the Secretary of the Treasury, December 12, 1838, turned on the feed water. A crackling noise and some leakage, due to unequal contraction, were the only noticeable consequences. The same authority tells of a similar occurrence of which he was a witness which had no more serious results. Many such instances are known to have taken place, and the Franklin Institute of Philadelphia and individual experimenters have furnished ample evidence that, with low steam pressure, it is by no means certain, or even probable, that an explosion must be consequent upon a deficiency of water in the steam boiler. This prevalent theory, which was, as we have seen, disproved even before it had become a tradition, is too often made a scapegoat for those guilty of carelessness or recklessness in quite other directions.

It cannot, however, be too earnestly impressed upon those having charge of steam boilers that, although the majority of explosions are due to either ignorance or recklessness in working boilers too weak to bear the pressure to which they are subjected, low water may, and sometimes does, produce explosions. Iron heated to a red heat loses a large proportion of its strength, and at a white heat retains, practically, no cohesive force. A boiler under steam, therefore, if its heating surfaces become uncovered where liable to be overheated, will be apt to lose strength, as this overheating progresses until, at last too weak to sustain the usual pressure, an explosion takes place. It is thus that such disasters usually occur, and not, probably, in consequence of pumping cold water into empty but overheated boilers.

Where a boiler still contains some water below the line of overheated surface, the introduction of additional water may, in rare cases, by suddenly cooling a part having, a moment before, a very high temperature, produce new strains that may precipitate a catastrophe; since, in such cases the boiler cannot become, in effect, a condenser, as in the example which prompted this article. The additional quantity of steam generated under such circumstances may also result similarly. Low water may, therefore, produce either explosion or collapse, or it may cause no dangerous result, according to the peculiar circumstances of the case.

THE PROPOSED INTRODUCTION OF WATER METERS IN CITIES.

The city authorities of Brooklyn are manifesting some apprehension regarding the enormous waste of water in that city. That a vast and unnecessary drain is thus made upon the supply is fully evidenced by the fact that the amount now used averages fifty gallons per day for every individual of the population, and it is in view of the circumstance that the present yearly consumption would soon exceed the capacity of the reservoirs, now 40,000,000 gallons, and necessitate the incurring of heavy additional indebtedness of the city, that the municipal government is seriously considering the introduction of water meters. It is estimated that the expense of these appliances, extending their use into families, would be about $1,000,000, and the yearly cost for repairs some $100,000. All manufacturing establishments in Brooklyn are metered at the present time, and are paying at the rate of two cents per hundred gallons.

We notice that the Commissioner of City Works makes reference to the fact that numbers of the water meters now in use have cost with their connections from $50 to $70 each. This sum, he justly believes, is unnecessarily high, and considers that suitable apparatus may be obtained at less figures. The subject of introducing water meters in New York has also been discussed for some time, and will eventually be adopted. It would be well for inventors to turn their attention to this matter, as there will be a large market opened for cheap and efficient forms of water meters one of these days.

THE INTERNATIONAL METRIC COMMMISSION AND ITS WORK.

The commission formed of delegates from thirty nations which met in Paris and was charged with the determination of uniform standards of weights and measures based on the French metric system has recently closed its joint labors. The countries represented were Belgium, Switzerland, Italy, Spain, Portugal, Prussia, Greece, Turkey, the Spanish-American republics, and English India, in which the French system is already in use; Austria, where it has been adopted since January 1st of this year, and England and the United States, which, without rendering the use of the metric standard obligatory, have admitted its legal employment in connection with the older method.

The Commission devoted its labor to the most exact examination of the standard in the French archives. The model was a platinum bar of one meter in length from end to end. It remained to determine whether the shocks to which it had been submitted during its repeated use in verifying other standards, or changes which might have taken place in its molecular construction, had not slightly altered its length, and whether its faces were absolutely true.

M. Fizeau, by a series of accurate investigations, showed that, while rules of iron and copper have varied in their construction in course of time, no similar property exists in iridiated platinum, which is analogous to the metal composing the bar in question; nor does this alloy ever vary in dilatability. This point was therefore first established. Attention was next directed to the extremities of the standard. Microscopic examinations were made, and, by the reflection of a filament of cobweb almost in contact with the polished surface, it was found that the latter was regular and had suffered no change. On the faces, the microscope showed among the circular lines, which proved the work to have been done by the processes of the lapidary, one apparently differing from those around it. In order to discover whether this facet had had any influence on the length of the meter, which it was necessary to be sure of to the one ten-thousandth fraction of a thousandth part, a very delicate microscope was constructed; and in order to measure this infinitesimal distance, the dust forming the globulous silica of the geysers of Iceland, and composed of little spheres perfectly regular to the hundredth of a millimeter in diameter, was employed. Through such accurate means as we have outlined, the length of the bar was determined not to have changed.

The Commission then decided that to constitute the international meter, of which a copy should be sent to the government of each nation represented, the meter in the French archives should be reproduced in exact *fac simile*, and made of iridiated platinum, that is, platinum containing one tenth part iridium, with a margin of two per cent more or less of the latter metal. The standard will be constructed as a line one meter long traced on a rule of 102 hundredths of a meter in length.

Investigations similar to those already detailed led the commission to adopt, for the type measure of weight, the kilogramme of the archives in its actual state. This standard will also be of iridiated platinum and a *fac simile* of the old one. The copies will be executed by the French section of the commission with the assistance of a permanent committee, who will minutely follow all operations to their completion and final verification by the conference.

THE SEWING MACHINE MONOPOLY.

To the Editor of the Scientific American:

Heaven bless you for opposing the reissue of patents to the great sewing machine combination! In our little hamlet of only a score of laborers' cottages, there are three cases which are eloquent petitions against it. In one, a soldier's widow with one crippled foot patiently uses the other to earn the exorbitant price of $87 which her Wheeler and Wilson has cost her. In another, a sad eyed young mother, deserted by a cruel husband, is at work by the week to pay the same price for a machine, assisted by her noble young brother of twelve years, for her wages alone are not equal to making the required monthly payments and clothing herself and child. In the third, is a young girl who has finished paying for her machine by daily labor in carrying off brick and making flower pots in a pottery which is the nucleus of our little cluster of humble homes. That her eyes were bright and her smile ever cheerful while earning the machine which was to assist in doing the sewing in her father's large family is no reason why she should spend weeks of toil in adding money to the purse of a millionaire.

These cases are not exceptional; there are thousands even worse all over the land, and in using your powerful influence against this grinding, pitiless monopoly, you take a position in the foremost ranks of philanthropists.

MRS. SARAH S. THOMAS.

Carbon Cliff, Ill.

The above is a fair sample of the results of the work of the monopoly known as the Sewing Machine Combination, the future existence of which depends upon the grant of new patent extensions by Congress. It is, as our correspondent demonstrates, from poor women that the greater portion of the profits are made.

We earnestly hope that Congress will refuse to entertain the extension. Poor people will then be able to buy sewing machines at reasonable rates.

THE Springfield *Republican* says: "The sewing machine ring is made up of the two Howe companies, the Willcox & Gibbs and the Wheeler & Wilson, Grover & Baker and Singer. The first three are all controlled by Mr. Stockwell, the new king of Wall Street, President of the Pacific Mail, Atlantic and Pacific, Samana Bay, etc. The ring are reported to have pooled up nearly half a million dollars to carry through a renewal of one of their representative patents. But it is a bad year for jobs at Washington. The members are becoming painfully virtuous or, rather, terribly scared. One of the sewing machine makers out of the ring predicts that, if the monopoly doesn't succeed in extending their patents, first class sewing machines will be down to $12 apiece within a year." The Troy *Times* adds: "We suspect that machines will not soon sell for a dozen dollars each. All the best machines cost more than that. But there is no sort of doubt that the most approved sewing machines might be sold, with reasonable profit, for $20 to $25. It is one of the heaviest taxes now imposed on the industry of the country, to lift the price of sewing machines by royalty from $30 to $60 or $65. We believe that nothing short of bribery will carry the proposed extension, of the patents about expiring, through Congress. Let the people watch their representatives upon this question."

THE ANNEXATION OF BROOKLYN TO NEW YORK.

The consolidation of Brooklyn and New York under a single municipality is being discussed in both cities. The union would prove of material advantage, as the business relations of Brooklyn are so closely connected with those of New York that it appears essential that both should be under the same government. The annexation of Brooklyn would probably be but the precursor of the absorption of other suburbs within the State into the corporate limits of the metropolis, thus giving to New York that vast increase in area, wealth and population to which, as the outgrowth of her prosperity, she is justly entitled.