

New Hewitt Tube Electric Light

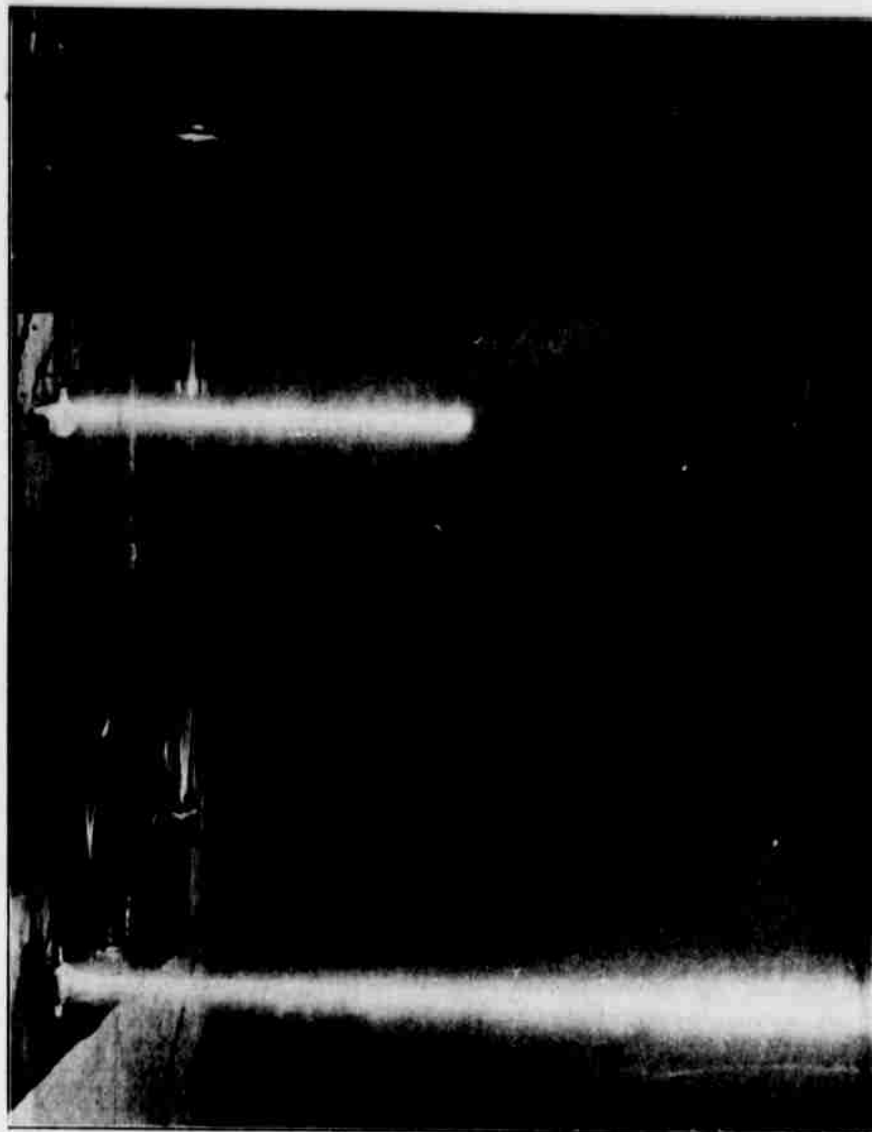
ONCE in a while it is given to the sons of the rich to ride out of the ranks and to distinguish themselves in the field of might. Quite recently it was young Vanderbilt inventing a locomotive. Just now it is Cooper Hewitt, giving the world a new light. His case is even more spectacular than that of Vanderbilt, for the effects of his invention will be more far-reaching.

The interest evoked by such a man cannot be less than that inspired by the far-reaching effects of his work. And to gauge the latter let it be said that he has succeeded in a field in which our best scientists have as yet produced nothing.

It is now more than four years since Peter Cooper Hewitt began his experiments in Madison Square garden. He opened his laboratory in the tower of the garden, just one floor under the gilded statue of Diana. The very prominence of the situation lent it a certain obscurity. He wished not to be disturbed and no one would think of looking for the workshop of a scientist in the same building that harbored horse shows, cycle meets and spectacle plays. He labored with that chimera which sooner or later claims the attention of all scientific men—the production of light without heat. He studied the work of Tesla, of Edison, of Crookes. He followed their lead and, having tested their experiments, he soon made up his mind that they had not reached the uttermost limits of this department of electrical research. He was young and time was no object. He had abundant means, so money did not count. Occasionally the societies heard of him when he told of certain progress he had made. To his friends he was a promising young scientist, who might do something some day. Generally speaking, however, the public heard little of the young inventor in the tower.

The "some day" came with the new year. On the evening of Friday, January 3, passersby in front of the meeting hall of the New York Society of Mechanical Engineers saw what appeared to be a column of light extending up and down the house front. The light came from a glass tube and it made the street nearly as light as day for a hundred feet in every direction. It was the invention of Young Peter Cooper Hewitt. The meeting hall of the building was lighted by four tubes similar to the one in front and the inventor was even then within explaining to the society members the nature of his discovery. The four tubes which hung in the hall illuminated it with a brilliancy equal to 500 candle power and photographs of the assembled members were taken with the new light.

The Hewitt lamp, however, is so thoroughly adapted to present day conditions that no special wiring is required, no special dynamo is necessary to operate it. It may be attached to any incandescent light circuit now in use and it will glow as readily as an Edison lamp, only with many times the brilliancy. And yet the perfected lamp is such a simple affair that one wonders some of the brainy men of the scientific world had not hit upon the idea long ago. It is actually a fact that many of them not only experimented with this style of lamp, but even tried lamps of the very size, shape and contents of those used by Mr. Hewitt and, failing to produce the desired effect, discarded the idea as impossible. The lamps used by Mr. Hewitt are in the shape of glass tubes, from one to ten feet long and from one to four inches thick. There is a small amount of mercury in each tube and the current acting on the mercury generates a gas which yields an intense white light. It is only necessary to attach a tube to an ordinary incandescent lamp circuit and it will light up. Mr. Hewitt encountered the same difficulties as the other scientists. The tubes would not light up at first. But he thought there must be some underlying principle which could be discovered it would solve the difficulty. He finally put it to the test of mathematics and worked it out algebraically just as Prof. Pupin worked out the principle of ocean telephony. It took him



A SIDE VIEW OF THE NEW HEWITT TUBE LIGHT.

four years, but the result was triumph, for the tube lighted up in the end.

A first visitor to the tower is surprised by two things—the intense scientific order that prevails and the brilliancy of the illumination. One of the tubes projects outward from the wall and you notice that it has a green tint. Looking from the windows far over toward Broadway, the houses and the streets and the atmosphere appear reddish in hue. That is due to the color of the particular lamp which is lighted. Someone turns it off and you begin to see things from your accustomed viewpoint or rather hue point. Mr. Hewitt comes forward. He is well favored physically and one would say about 35 years of age. In reply to your questions he plunges at once into the subject of vacuum lamps, but his attitude is more reticent than enthusiastic.

"This lamp," said the inventor, pointing to a U-shaped tube, which hung by a string from the ceiling, "is not a vacuum lamp in the sense that there is nothing in it. The air has been almost exhausted, but there is, as you may see, some mercury in the lower end of the tube. It would not be possible to send a current of electricity through a complete vacuum. Something must be left to conduct the current. In this case it is mercury vapor. All substances may be rendered into a gaseous state if brought under the influence of more or less heat and when we try to pass a current through that tube enough heat is generated to create a vapor or gas of mercury which fills the tube. The current passing through that vapor produces the illumination you now see."

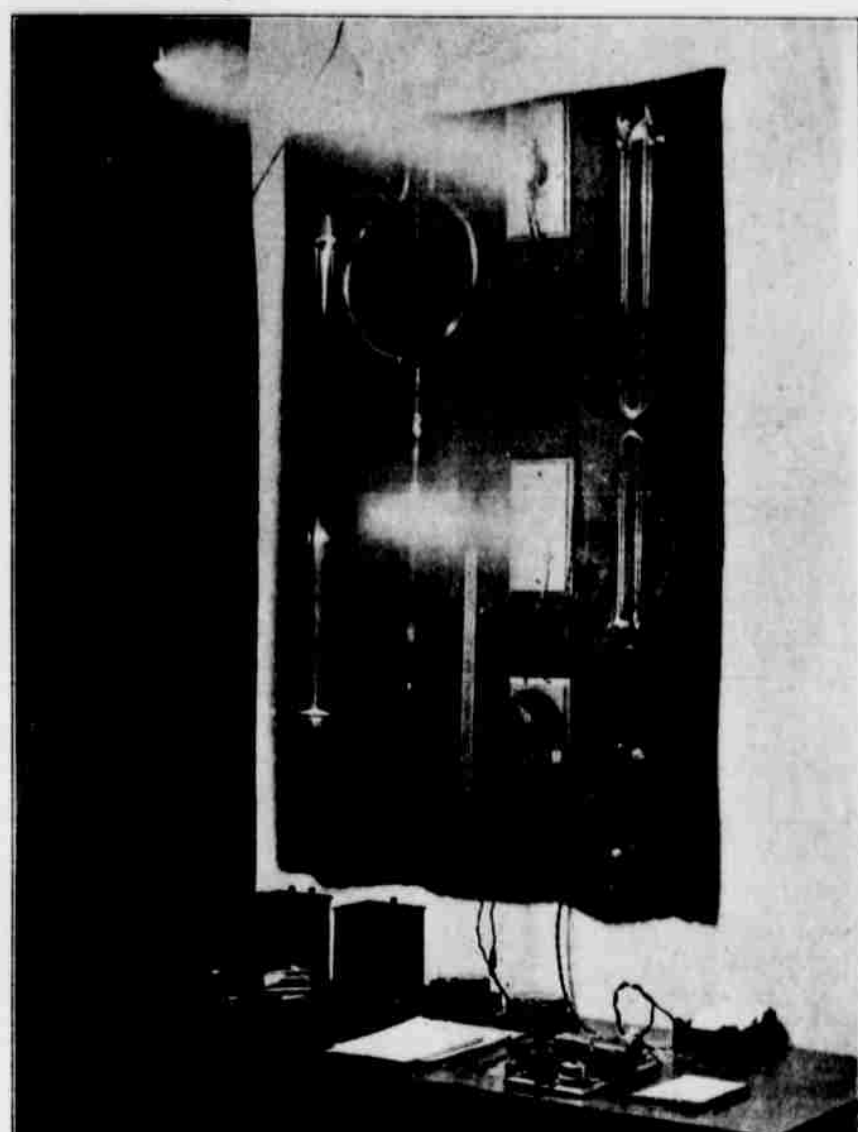
Mr. Hewitt snapped a switch under another lamp which was attached to the wall. Immediately this tube lighted up with a glare equal as it seemed to the light of an arc lamp.

"That lamp," he continued, "is operated on the incandescent lighting circuit of this

building, the same circuit employed to light the ordinary 16-candle power bulb lamps, such as are everywhere in use. But the illuminating power is eight times that of the ordinary lamp. I have made lamps with diameter of bore less than one-eighth of an inch and as large as three inches, and from less than three inches in length up to over ten feet, giving from less than 10-candle power up to fully 3,000. Lamps of innumerable shapes and dimensions have been constructed and great variation of candle power for various diameters obtained and there appears to be no reason why lamps may not be made of any size and of any desired candle power, the only limitation being that of softening the glass when too many candle power per inch is produced.

"In the incandescent lamp the carbon filament is highly resistant to the electric current and the passage of the current heats the filament so that light is generated. In the new lamp the mercury vapor takes the place of the filament. Its resistance, however, is very much greater than the resistance of the carbon, and when sufficient current is passed a much more brilliant light is produced. It was thought to be impossible to use the constant current because the very resistance of the vapor kept this current from passing through.

"I discovered a peculiar fact, however, and working therefrom solved the problem. I found that the resistance of the mercury vapor was only, as it were, momentary. That is, the moment any current at all was passed through the tube the current itself seemed gradually to break down the resistance until at last the resistance became so small that even a constant or incandescent current would light the tube. At present I use a small spark or induction coil to open the path immediately for the current. In short, if the current is turned



NO MORE APPARATUS IS REQUIRED THAN FOR THE ORDINARY BULB LIGHT.

into the tube, ordinarily it will not light until a spark from the coil is first driven through to break down the resistance, to blaze a way, so to speak, for the current. Of course, the whole operation is instantaneous."

One of the spark coils was attached to the lamp on the wall and when Mr. Hewitt turned on the switch to light the lamp the snapping of the sparks could be heard. The intense whiteness of the light became the subject of comment. It has always been said that tube lighting would be undesirable because of the absence of red rays. Mr. Hewitt was asked about this. He replied:

"The light produced by pure mercury gas comprises orange-yellow, lemon-yellow, green, blue, blue-violet and violet, and although all shades of these colors may not be present their absence would not be so seriously felt were it not for the absence of the red. For some purpose the lack of red in the spectrum is objectionable, but for many uses it is a positive advantage. For shopwork, draughting, reading and other work where the eye is called on for continued strain the absence of red is an advantage, for I have found light without the red much less tiring to the eye than with it. It is possible to transform some waves of this light, especially the yellow light, into red light, and thus in a measure to overcome this defect where required for general indoor illumination. A moderate amount of ordinary incandescent light interspersed with the mercury vapor electrically serves to supply the deficiency, and the mixture may be made most satisfactory.

"For street lighting purposes the mercury is available even without the red and it should be noticed that this light has very great penetrating power and seems to be effective through greater distances than an equivalent amount of measured candle power from the ordinary incandescent lamp. This may be due to the fact

that the waves of the red light are less penetrating than those waves which are present in the mercury light, and hence the least valuable portion of the spectrum having such illuminating effects is omitted and the energy is practically expended in the more useful portions of the spectrum. I have made lamps in which this color objection has been overcome, sacrificing on some occasions the extremely high light efficiency obtained in this particular lamp. Without doubt lamps of this type will be produced whose light will be even more beautiful than this light is objectionable. The fact that different gases or vapors produce different colors opens the way for experimentation in this line. I have produced lamps of various colors. Hydrogen gas gives a large amount of red rays; so does nitrogen. I have made blue lamps and yellow. This feature of the color rays will be improved with time. There is a precedent in the Welsbach lamp, which was very blue when it was first used, and in the Nernst lamp, which has also been improved. Even the Edison incandescent lamp was defective in its color quality when first invented."

In the opinions of many scientific men, the invention of the Hewitt lamp is the greatest electric lighting achievement since the Edison lamp was given to the world. The cost of running the new light is now but one-eighth of that of the Edison lamp, power for power. It must, therefore, be more economical than gas, even as cheap as kerosene. The darkest parts of cities could be lighted as well and even more economically than their main streets. Lighthouses will be able to shed their rays many more miles out to sea than they do at present. The danger of collision between steamships will be minimized. In short there is almost no department of public or private life that would not be benefited by such an illuminant.

Episodes and Incidents in the Lives of Noted People

DANIEL AND WILLIAM HUTCHINGS, twin brothers of Scipio, Ind., are so much alike that only their wives and children know them apart. A few years ago Daniel sought admission into the Masonic order, but the members, for what they regarded as prudential reasons, insisted that William should join also, and the twins were put through together. In their courtship days—they are now 53 years old—they used to spark each other's sweethearts and the girls did not know the difference.

Senator Kearns of Utah began life as a miner and attained to fortune and to influence solely through the exercise of an indomitable will and an unconquerable disposition to persevere. He knows the value of money so well that he declines to waste time in the idle speculations, so dear to some men, touching financial propositions which do not exist. Not long ago some senators, among whom was Kearns, were discussing large fortunes in one of the capitol cloak rooms. Kearns took no part in the talk until some one called attention to the fact that a certain millionaire was reputed to have received \$75,000,000 in cash for his share of stock

in a great corporation. A senator whose fortune does not go beyond the limits of his salary turned to the representative from Utah and said: "What would you do with \$75,000,000 in cash?" Kearns looked his interrogator over for a moment and then slowly replied: "Well, that's a little too much money to spend in a few minutes' conversation."

For three months Andrew Carnegie was "posted" on the bulletin board of the St. Andrew Golf club, Westchester, N. Y., for 50 cents. Mr. Carnegie had forgotten that he had contracted the debt and under the club rules, which are impartially enforced, his name had to be added to the list of delinquents at the expiration of thirty days. When his attention was called to the notice on the bulletin board he laughed and sent in his check for the amount due.

Coming east to Boston some time ago, relates the Boston Post, Senator Warren of Wyoming traveled on a certain railroad and lost his trunk. It contained many valuable costumes belonging to his wife and his own outfit, so that its loss was no small matter. He struggled for some time to find a trace of the trunk, but without success, nor could he secure any reim-

bursement. His method of getting even was unique.

Upon returning to Cheyenne he placed a watchman in the railroad yards with instructions to report the arrival of the first freight car bearing the name of the road upon which he had traveled. In a day or two the watchman gave the necessary information. Senator Warren at once went before a local magistrate and sued out an attachment upon the freight car. Then he wired to the railroad officials stating what he had done, and awaited results.

In less than three hours came a dispatch saying that a check for the value of the missing trunk had been forwarded to him, and asking him to let the freight car proceed upon its way. Then the suit was withdrawn.

The statement was made the other day in the New York Tribune that, in spite of his advancing years, Colonel Henry Watterston of Louisville gets to his office every morning at 7 o'clock, which necessitates very early rising, as he lives twenty miles from Louisville, and drives to his office behind a spirited pair of Kentucky mares. This has elicited from a correspondent the following: "The information here given

should have come under a 'New Fiction' heading. 'Marse Henry's' office hours are more nearly 12 to 1 every other Wednesday, and on the pike, with the reins over a pair of spirited mares, God save the other vehicles!"

The London Academy reprints from Charles Stewart's recently issued autobiography, "Reminiscences of Legal and Social Life in Edinburgh and London, 1859-1900," the following reminiscence of Tennyson:

"With Alfred Tennyson in his latter years I had rather frequent opportunities of meeting, both in London and at his country home. Personal intimacy with great authors is a dangerous experiment, and especially with great poets, for their imaginative writings have stimulated one's ideas about their personality till one foolishly half expects to find their genius displaying itself in every word and action of their daily life. Tennyson fulfilled such an unreasonable ideal perhaps as well as any man could, for his personal appearance, with which every one is familiar, was, of course, magnificent and his manners and habits of life were dignified, if a little poetically eccentric. But the adulation which he received from his family and friends was somewhat sati-

ating. I have seen Mrs. Greville, a woman herself of the most brilliant talent, actually prostrate herself on the floor before him, just as I have seen ladies of rank and talent literally sitting at the feet of Sir Henry Irving. Tennyson would have been more than human if he had resisted the effect of this hero worship.

"A little niece of mine was one day standing beside his chair; he lifted her up and placed her on his knee for half a minute and then he put her down, saying: 'Now, you can say you have sat on Tennyson's knee.' It was kindly meant, but there was a self-consciousness in the word and in the act which was not infrequently to be observed in the poet."

Frederick Russell Burnham, upon whom King Edward has conferred the Distinguished Service Order, in consideration of his work as scout in South Africa, is a native of California and a resident of Pasadena. He went to join Lord Roberts in the Boer war in the spring of 1900. Burnham has a wide reputation for his ability as a scout. Before going to South Africa he had been spending some time in Alaska.