

A MODERN WIZARD

Thomas A. Edison in His Workshop at Orange, N. J.

BY FRANK CARPENTER.

"The United States patent system puts a premium on rascality. I have taken out 700 patents for my inventions, but I have never had one minute's protection." The speaker was the great inventor, Thomas A. Edison. The time was about 11 o'clock one morning a few days ago. Mr. Edison had had no sleep for 36 hours and during the 72 hours before this he had closed his eyes for less than six. Still he looked as fresh as a daisy when the morning sun strikes the dew on its petals, and the sparkle of his eyes and the laugh which shook his frame from time to time were those of a boy. He was in the midst of one of those inventive periods when he takes but little rest and works away night and day to accomplish his end. He had left his chemicals to talk to me and he came in his shirt sleeves with his vest of Scotch tweed open at the front and with his shirt bosom of white linen decorated with spots of all the colors of the rainbow. These spots were having a kind of polka-dot dance up and down his great chest. They went in and out between his gold studs and some were stains of yellow and others of wax and melted brimstones. An odor like that of the hell broth of *Macbeth's* witches came from the chemicals in the room and all of the surroundings showed the simplicity of its owner. During these inventive periods Edison sleeps in his laboratory and his meals are sent down from his magnificent home at Llewellyn Park. Upon a plain table covered with brown paper lay the remains of his breakfast. There were the bones of two mutton chops, the crumbs of a muffin and a glass fruit jar in the bottom of which was a little coffee of the same brown color as that in the glass beside it, out of which Mr. Edison had evidently drunk instead of a cup. In one corner of the room was a washstand with a couple of well-used towels over it and the remainder of the space was taken up with bottles, machines and other articles of an experimental kind. The room in which Mr. Edison sleeps when at the laboratory is quite as simple and his bed is a folding arrangement which you could buy anywhere for \$25.

Still this laboratory all told must cover several acres. Its original cost must have been more than half a million dollars and it takes, it is said, more than \$100,000 a year to run it. It is the most complete laboratory in the world and no inventor in history has ever had anything like unto it. In its store-room, which, by the way, is bigger than any country church in America, Mr. Edison has pieces of every known material, substances from, as he says, a spool of cotton to the eyeballs of a Parliamentarian. He has everything from moss from Iceland to a hippopotamus's tooth, and he has pieces of every variety of vegetable, animal and mineral substances so that he does not have to go out of his laboratory for anything. There are more than 25,000 different articles in the store-room and some of these come as high as \$1,000 an ounce. Edison's photograph gallery. The workshops of the laboratory cover, I judge, more than four acres of floor space and the great brick building with its big windows looks more like a factory than a place for the making of experiments. Everything in it is of the most complete kind in the world from its mechanical rooms to its musical department and you will find no finer photograph gallery anywhere in the country. The head of this, Prof. W. L. K. Dickson, has an international reputation as a photographer and he brings out every week some new wonder in his experiments. He has a wonderful skill in the use of the camera upon objects under the microscope and one of Edison's great suits was gained lately solely through the photographs made of a slice of Japanese bamboo from which was shown the fibrous of which Edison makes the carbon for his incandescent lamps. The slice consisting of a section smaller around than the smallest slate-pencil was magnified to the size of the bottom of a dinner pail, and a section of this photograph was put under the microscope and again magnified so that the pictures showed the little fibres of the bamboo which after experimenting with a thousand different articles from all parts of the world Edison decided was the best for his light.

One of the last experiments in this photographic department was a photograph of the head of a house-fly. This photograph lies before me. The head as magnified is as big as that of a Newfoundland dog and it has hair standing out from its center in all directions as though about 50 camels' hair brushes with hair two inches long had been driven into a place the size of a trade-dollar. Its eyes stand out from the head and in the photograph each eye of this fly which in the original was not larger than the head of a pin is bigger than the palm of my hand and it is made up of thousands upon thousands of little bits of eyes fastened together like a honey-comb, and Mr. Dickson, Edison's photographer, tells me that if you will lay your watch, face upward, down near the eye of a fly under the microscope you can read the time in each one of these 10,000 eyes.

Only an electrician can appreciate the wonders of the electrical appliances of this laboratory. In one large room the machines are so delicate that solid walls 30 feet deep have been built under the slate slabs supporting them. They rest on solid masonry and are so arranged that nothing near them can affect their motion either by sympathy or vibration. In one room I found hundreds of these little globes with wires of lights inside of them all blazing away though it was the middle of the afternoon. "These lamps," said Mr. McGuire "are all made differently and we are testing them. Everyone of them has its biography. It is closely watched from hour to hour and the brilliancy and the time it will burn without breaking or wearing out is carefully noted. Through this in time we hope to get the perfect lamp and the perfect carbon which will burn forever. In another room lamps were being exhausted and filled. In another the glass was being blown and in a third I found a chemical laboratory devoted to the assaying and reduction of metals, and here Mr. Edison is working away on the reduction of iron, silver and gold. In our conversation he told me of the vast iron fields of New Jersey out of which the companies with which he is connected are now making fortunes and as soon as he completes his experiments in iron he is going to devote himself to the more precious metals of silver and gold. Other rooms were devoted to heavy machinery and there is hardly any kind of a machine from

a steam engine to a pin that could not be made in this laboratory. It is Edison's pet. The inventor is worth millions but he prefers this to steam yachts, coaching excursions, polo and the amusements of other millionaires and his greatest delight is in his work. During our talk I asked him how he felt when he discovered a new principle or something important in invention and he told me it made him happy all over and that he grasped at it as the botanist does at a new flower or the biologist at a bug which he discovers and knows is new to science.

"Do you think, Mr. Edison, said I, that the inventions of the next fifty years will be equal to those of the last fifty?"

"I see no reason why they should not be," replied Mr. Edison. "It seems to me that we are at the beginning of inventions. We are discovering new principles, new powers and new materials every day and no one can predict the possibilities of the future. Take electricity. When we get electricity directly from coal a lump as big as this tumbler will light and heat a whole house for hours, and a basketful would run a factory a whole day. In the generation of steam we only get fourteen per cent. of the energy of the coal. In electricity we get 96 per cent. When we get one electrical power direct from coal a few hundred pounds will carry you across the Atlantic and a few baskets full will take a railroad train from New York to San Francisco. I believe this to be one of the great problems of the future and I have no doubt but that it will be solved. I have been working on it for years but I haven't got it yet. When it does come it will revolutionize everything. It will cheapen everything and it will be the greatest invention of modern times."

"Will we ever have flying machines?"

"Yes, I think so," was the reply "but it will not be on any of the plans now proposed. I have a different idea in regard to such matters, but I am not ready to experiment with them yet."

"How about the making of fuel from water?"

"I don't believe it will ever pay" replied Mr. Edison. "Water is the ashes of nature. There is nothing more like ashes. It took an enormous degree of heat to make the hydrogen and the oxygen combine to make water and it takes a great degree of heat to revivify them. I don't believe it will ever be commercially profitable."

The conversation here turned to the telephone and I asked Mr. Edison as to his telephone experiment is the biggest thing of the kind in nature. There is in the New Jersey mountains a vast mass of iron a mile long and of about the same width which runs straight down into the earth for a number of miles. "The telephone," said Mr. Edison, "is, you know, made by running a wire around the top of a magnetic bar and this machine when charged with electricity enables us to register the sounds which come in contact with it. We are using this immense natural bar of iron of the New Jersey mountains as the basis of our telephone. We have wound miles of wire about its top and have formed an inductive circuit in which we will have the most powerful of electric currents. We expect through it to hear the noises made on the sun and the explosions which are supposed to be constantly going on there will I believe within a few weeks be heard right here. We have been working at the matter for some time and have it just about ready for testing."

"We have by no means reached the perfection of the telephone," Mr. Edison went on. Improvements are being made all the time and the day will come when everyone will have his telephone. Long-distance telephoning is growing and the only restriction of the possibilities of the telephone is in the sympathetic contract of the electrical wire with the rest of nature. If a single wire could be placed so high above the earth that it would not touch the mountain tops, you could whisper around the world and you could sing a song in London and have it heard in Pekin. Wherever we get the wire comparatively free from contact with the earth distance seems to make no difference and on a government line 1,000 miles long over treeless country in Arizona we got a better telephonic connection than we do now between New York and Philadelphia. If we could have a telephone from the earth to the sun—I mean wire we would send sounds there with perfect ease, and with the photograph, were our language universal, we could make a speech here and have it recorded and reproduced in any of the great planetary bodies."

I here asked Mr. Edison as to the photograph and he told me that a large number of them were in use and that he believed they would be eventually used everywhere. He took me into his laboratory and showed me his last invention in connection with the photograph which he called by the name of kinetograph, and which is almost as wonderful as the photograph itself. With the photograph you can take a song of Patti from the lips of the diva and can reproduce it before an audience in all its intensity and beauty a year later and a thousand miles away. By the kinetograph with the aid of a stereopticon you can throw on a screen a picture of Patti just as she looked and acted at the time she was singing the song and one of the great exhibitions of the future will be the reproduction of great speeches and songs in this way. You can reproduce a pantomime with the kinetograph and you can make Chauncy Depew deliver the same after-dinner speech a thousand times with the same gestures and the same smile if you can once get him before it. It is made by instantaneous photography of the man who is to be reproduced. The machine takes him in action and it so works that it takes 2,700 photographs every minute that is speaking, or 46 pictures of him every second. These photographs are taken on a long strip of gelatine film and in reproducing them they are made to revolve as fast before the eye as when they are taken. The result is that the eye does not see the 46 photographs but it sees only the one with the motions or gestures of the man. I saw one of these machines in motion representing one of Mr. Edison's employees taking a smoke and you can see the man raise the cigar to his lips, turn his head, and blow out the smoke just as naturally as though he were in life.

Another set of photographs represented a boxing-match and it was as natural as though the men were actually fighting before your eyes and it sometimes took a dozen photographs to make a single motion. Mr. Edison expects to show this machine in its perfection at the Columbian Exposition. The machine I saw was a nickel-in-the-slot machine and it will probably be on the market in a short time. The strip on which the photographs are taken is about as wide as a

tape measure, but the figures are magnified through a glass in looking at them.

I asked Mr. Edison as to the profits of the photograph. He replied that the invention had not been managed as well as it should be, and he spoke of Mr. Lippincott of Philadelphia, the man who some time ago had the contract to manage the phonograph and graphophone. Said he, during the talk on this subject:

"Lippincott is suffering from a clot of blood on his brain. The doctors say this clot is about the weight of a gram, but how over big it is, it has lost Mr. Lippincott a million dollars. A million dollars a gram; \$60,000 an ounce. That's the most expensive material I have ever heard of. I don't know whether he will recover or not, but the phonograph will eventually pay and pay well."

Mr. Edison takes pride in having been a newspaper man. He likes to talk of the days when as a boy he edited and printed the Grand Trunk Herald. He tells me he was a newsboy on the train when he did it and believes it is the only newspaper that has ever been published on a newspaper train. He ran it for more than a year and by virtue of it he says he is now a member of the New York Press Club. He talked with me as to the newspaper reports which he sent out while a telegrapher and told me that the worst copy he ever handled was that of George M. Bloss of the Cincinnati Enquirer. Said he:

"I was a telegraph operator at Cincinnati at the time he was editor of the Enquirer and his copy sometimes came into the office. I remember one piece which none of us could translate and we sent it back to the Enquirer office and had them copy it for us. It was worse writing than that of the Horace Greeley and I remember that we tacked a piece of it upon the wall of the telegraph office and left a standing offer of \$10 to the first man who could decipher 10 lines of it, and the money was never claimed."

"Such a thing will never happen," said I, "when newspaper reporters turn in their copy on the phonograph."

"No," replied Mr. Edison, "it will not. The phonograph and the telephone are now considerably used in newspaper work and we may have newspaper photographs in the future, and newspaper pictures may be sent from one part of the country to the other by electricity."

"Will it ever be possible, Mr. Edison," said I, "to take the page of a newspaper as set up in New York and telegraph such a photograph of it to the other great cities of the country as could be placed at once on an etching plate and one setting up in this way do for the whole country?"

Mr. Edison thought for a moment and then said, "Yes, that could be done, though I don't know whether it would be profitable; and the day may also come when a man sitting at a type-setting machine in New York may by tapping the keys of a typewriter set up the press dispatches by means of similar machines in every newspaper office of America. There is no doubt but this could be done now, and when we have perfect type-setting machines our press telegraphers can do the setting up of their own dispatches."

As we talked in this way running rapidly from one subject to another my wonder as to Mr. Edison's wonderful vitality increased. As I said above, though he had had only six hours sleep in 72 he showed no signs of weariness and his health seemed to be perfect. What man of 52 who reads this paper could act and feel fresh after 36 hours out of bed? Edison is 52 and he looks as though he would live to be a hundred. Said he in response to my question:

"I feel that I am in my prime and I suppose I am a better man than I have ever been. I have the knowledge and experience of the past to go upon and I don't know why I should not do good work in the future."

"How about your stomach," said I. "Thomas Carlyle, you know, says he did not know he had a stomach until he was 22. How about you? Do you know that you have a stomach?"

"Yes," replied Mr. Edison with a laugh, "I am like Carlyle in that I have discovered the fact. I find that I have indigestion sometimes, but I can easily cure myself. I do this by change of diet. The stomach is a chemical laboratory and digestion is merely a chemical operation. If I find that my stomach is not working rightly I know that the right chemical action is not going on inside of it and I change my food. If I have been eating meat I drop flesh food altogether and confine myself to vegetables and in a short time I find myself all right. If I've been eating more vegetables than meat I drop the vegetables and the meat brings me back to my normal state."

"How do you get along with so little sleep?" I asked.

"I don't believe," said Mr. Edison, "that man needs as much sleep as is generally supposed. I think we sleep too much and eat too much. Six hours or six and a half are plenty for me and I seldom take more. If I sleep eight hours I find that after breakfast I want to go to sleep again, whereas five hours puts me in splendid condition and I am ready for anything. I inherit a good constitution. My grandfather lived to more than 100 years of age and my father is 92. Neither of them were long sleepers, and I think sleep after all is more a matter of habit than anything else and that in the far future if we should have an artificial light which would make the world like day year in and year out we would never sleep at all."

This remark concluded my interview and after a walk with Mr. Edison through his laboratory I drove to the station past Llewellyn Park where Mr. Edison has one of the most beautiful residences in New Jersey. Here simple and unpretentious he lives comfortably with his family, devoting the most of his time to his life work of invention. His greatest happiness he tells me comes from his work and among the millionaires of to-day his life stands out as a lesson for the young men of the future.

Cigar End Collectors.

Who would believe that any one could make money out of cigar ends? Yet the business of gathering them is so lucrative that the Russian Philanthropic Society has organized a regular system in St. Petersburg of collecting these trifles, and disposing of them for the benefit of the poor. Upwards of \$1,500 was realized in the month of July. As to what is the ultimate destination of this refuse matter it would be somewhat hazardous to decide but possibly many young gentlemen who with "a fearful joy" puff away at cheap cigarettes might be able to tell.

HOUSEHOLD.

A Birthday Song.

A wish for the woman I love,
God bless her!
I wish that the birthday may always glow
With love and with sunshine and flowers that
blow
For the patient heart, the tender and true,
And yield their sweet fragrance her whole life
through,
For the woman I love,
God bless her!

A hope for the woman I love.

A hope for the dawn of a glad birthday,
When the tear-filled years shall be rolled away,
As the stone was rolled from the sepulcher,
And the angels sing the birth song to her,
To the woman I love,
God keep her!

A thought for the woman I love.

God bless her, keep her and love her for aye,
And smile on the steps of her earthly way,
And lead her, Himself, with her toil-worn hand
Held close in His, to the shadowy land—
Even down to that land—
God rest her!

Petty Dictators.

There is no spirit in the family that is so fatal to peace and consequently happiness as the desire to argue on trivial pretenses. One person possessed of the mania for setting all the rest right may make a household of worthy, easy-going people miserable. There is nothing right in the household except what she herself personally superintends; for the individuals who consider themselves delegated to the task of correcting the other members of the family are usually persons who devote themselves to this employment and have little time for any other work. The hard-working man or woman has no time to devote to the shortcomings of others. It is usually the sluggard and idler, who stands about and watches others work, who can suggest a dozen ways in which they could do better. The wise man of Israel has truly said: "A fool's lips enter into contention"; and the contentious fool is as common a nuisance to-day as he no doubt was in the time of Solomon. Usually in proportion to their lack of actual knowledge do such persons presume to set themselves up as dictators to the others of their households. If the household dictator is the mother of the family or an elder sister she steps aside from her legitimate sphere to argue and dictate to her husband or brothers in matters of business, about which she often knows nothing at all, and neglects her household. If the husband or a brother is inclined to exercise petty tyranny over the rest of the family, he is in nine cases out of ten a "hen-hussy" who fails to furnish his quota of support to the family, and works off the energy which might be employed in a worthier cause dictating to the others how they should work. As a rule the rest of the family where such a dictator makes his abode are too busy to do anything but stolidly submit to a nagging tongue, and they usually go stolidly on in their own way. Yet, like the dropping of water on stone, which in time leaves its mark, such arguing is a source of annoyance and wears upon the nerves of the listeners, however they have schooled themselves to bear and forbear. The men or women who exercise their energies as household dictators are altogether disagreeable specimens of humanity, but unhappily are not uncommon. The dictator is often the last person in the house who realizes the discomfort that his system of nagging produces, as such a person in the necessities of the case is a pre-eminently selfish individual, whose horizon is limited to himself and who only takes in the rest of the world as they are his and form a part in that way of his selfish interests.

How to Propose.

"Don't be too sudden about it." Many a girl has said "no" when she meant "yes" simply because the lover didn't choose the right time and pop the question gently. Take a dark night for it. Have the blinds closed, the curtains down, and the lamp turned most out. Sit near enough to her so you can hook your little finger into hers. Wait until the conversation begins to flag and then quietly remark:

"Susie, I want to ask you something."
She will fidget about a little and probably reply:
"Yes?"
After a pause you may add:
"Susie, my actions must have shown—that is, you must have seen—I mean you must have been aware that—"
Pause here for a while but keep your little finger firmly locked. She may cough and try to turn the subject off by asking you how you liked the sermon, but she only does it to encourage you. After a pause you can continue:
"I was thinking, as I was coming up the street to-night, that before I went away I would ask you—that is, I would broach the subject nearest my—I mean I would know my—"
Stop again and give her hand a gentle squeeze. She may make a move to get away or she may not. In either case it augurs well for you. Wait five minutes and then go on:
"The last year has been a very happy one to me, but I hope that future years will be still happier. However, that depends entirely on you. I am here to-night to know—that is, to ask you—I am here to-night to hear from your own lips the one sweet—"
Wait again. It isn't best to be too rash about such things. Give her plenty of time to recover her composure, and then put your hand on your heart and continue:
"Yes, I thought as I was coming here to-night how happy I'd been, and I said to myself that if I only knew you would consent to be my—that is, I said if I only knew—if I

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100 Doses One Dollar

was only certain that my heart had not deceived me and you were ready to share

Hold on—there's no hurry about it. Give the wind a chance to sob and moan outside among the trees. This will make her lonesome and call up all the love in her heart. When she begins to cough and grow restless you can go on.

"Before I met you this world was a desert to me. I didn't take any pleasure in life, and it didn't matter whether the sun shone or not. But what a change in one short year. It is for you to say whether my future shall be a prairie of happiness or one long and never-ending pathway of thistles. Speak, dearest Susie, and say it—"

Give her five minutes more by the clock and then add:

"That you—you will be—that is that you will—be mine!"
She will leave a sigh, look up at the clock, and round the room, and then as she slides her head over your vest pocket she will whisper:

"Henry—I will."

"German Syrup"

The majority of well-read physicians now believe that Consumption is a germ disease. In other words, instead of being in the constitution itself it is caused by innumerable small creatures living in the lungs having no business there and eating them away as caterpillars do the leaves of trees.

A Germ Disease. The phlegm that is coughed up is those parts of the lungs which have been gnawed off and destroyed. These little bacilli, as the germs are called, are too small to be seen with the naked eye, but they are very much alive just the same, and enter the body in our food, in the air we breathe, and through the pores of the skin. Thence they get into the blood and finally arrive at the lungs where they fasten and increase with frightful rapidity. Then German Syrup comes in, loosens them, kills them, expels them, heals the places they leave, and so nourish and soothe that, in a short time consumptives become germ-proof and well. @

Samson brought down the house, but nobody called for an encore.

In this world a man wants a good balancing pole to walk the narrow path.

Anybody can walk into the parlor, but it takes nerve to walk into the spider.

Young ladies and young men, too, had better be fast asleep than fast awake.

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