ble, and remain so as long as the paper is kept folded up and away from the light. But as soon as it is opened and exposed to the light of the sun, the writing will become visible, taking on a brown color at first, and then turning to a jet black.

How the Ink Works. When the light-waves of the sun fall on the paper, they partly decompose the silver nitrate ($AgNO_3$) and set free the nitrogen (N) and the oxygen (O) and leave a brown powder behind, which is nearly pure silver (Ag). When enough light-waves fall on it entirely to decompose the silver nitrate ($AgNO_3$), then a black powder is left, which is pure silver (Ag).

A Fluorescent Secret Ink. Dissolve some quinine sulphate ($C_{20}H_{24}N_2O_2$), the kind you take for colds, in a little water (H_2O) and use this as an ink to write with. When it is dry it cannot be seen, but if you will hold it up close to the sparks of an induction coil, the writing will appear to be of a blue-violet color.

How the Ink Works. When the light-waves strike certain substances, they are absorbed by the latter, followed by the emission of light-waves of a different and greater length, and this phenomenon is called *fluorescence.* The short, invisible ultra-violet waves that are set up by the sparks of an induction coil are absorbed by the quinine sulphate ($C_{20}H_{24}N_2O_2$), which then sends out longer waves and these produce wave-lengths that make violet light which can be seen.

How to Make Spirit Pictures.—The Effect. You show a dozen pieces of perfectly blank paper, about 1 by 2 inches on the sides, and after they have been examined you ask a

lady (an unmarried one of course) to select one of them, in order that you may show her her future husband. When she has selected one, you dip the blank paper into a saucer of water (H_2O) and while it is still wet you place it on her forehead. On removing it, there will be seen a photograph of a handsome young man with lots of money, a wonderful career before him, and all that.

The Cause. First of all, you make a dozen small prints from an ordinary photographic negative of a handsome young man, etc., etc., or better, make each print from a different negative. The prints must be made on what photographers call *silver paper*, such as was universally used 25 years ago but which is now employed chiefly by commercial artists for enlargements. The present-day *solio paper* will not do, and the silver paper must not be of the kind called *self-toning*, either.

After having made the prints, fix them *without toning* in a 10-per-cent solution of sodium thiosulphate ($Na_2S_2O_3$), and then wash them thoroughly. This done, immerse them in a 5-per-cent solution of mercuric chloride ($HgCl_2$), commonly called *corrosive sublimate*, and the picture will quickly fade out and the paper will appear to be perfectly blank. Finally, wash the prints again and let them dry, and you are ready to make the spirit photographs or, rather, make the spirits make the photographs for you.

Just before you are going to do the trick, make a 5-per-cent solution of sodium thiosulphate ($Na_2S_2O_3$), and this will look just like ordinary water (H_2O). Now when you dip the apparently blank paper into the solution, it only takes a moment for the reaction to make the picture re-

appear, and to prevent the lady from seeing this process you hold it on her forehead. A very pretty trick.

The Materialization of Mysteria.—The Effect. In the language of the spiritualist, the word *materialize* means to bring forth a spirit in bodily form so that it can be seen. Because spirits are made of stuff as intangible as dreams, they can be seen only when they are luminous and, hence, only in the dark, and so for this extraordinary test in psycho-physical phenomena you must have a perfectly dark room.

When you are ready to materialize *Mysteria*, have your audience seated in one end of the room, then turn out the lights and your *dark seance* is on. First, the spectators will see an uncertain ghostly light, like a will-o-the-wisp, close to the floor and near the other end of the room. And then this strange light, certainly not of this earth but mayhap of heaven above, begins to expand and at the same time to take on a more definite shape until it can be clearly seen to be that of the form of a girl. When she has been fully evolved, her face, beautiful beyond words, materializes from out of the ambient astral light, and grows so brightly radiant that her very features can be recognized.

She is none other then *Mysteria*, the beautiful spirit-bride, who has come back to the earth-plane and her mission is to put to shame the scoffers who disclaim a life hereafter. See! she rises from the floor and floats in the air as lightly as a bubble. Returning, she grows smaller and smaller and beautifully less until she can just be seen as a vaporish patch of light, and then she *dematerializes* before the very eyes of the spectators.

The Cause. It almost saddens me to tell you how *Mys-*

teria is materialized but since this is a book of living as well as of dead secrets I will give you the explanation. First of all, you need several *props*, as they are called in the show business, two rooms that can be made perfectly dark, and an assistant. To make the former, get some soft iron wire of about No. 10 or 12 gauge and fashion it into the outline of a girl, as shown in Fig. 163.

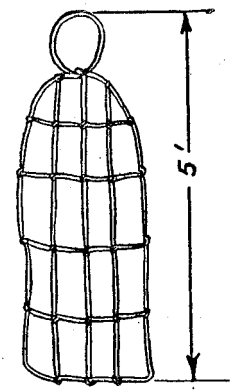

FIG. 163.—The Wire Frame.

Next, fasten a false face of a pretty girl to the top of it, and then paint this with *luminous paint* mixed with a little thin varnish. Luminous paint is made chiefly of phosphorus (*P*), so-called from two Greek words which mean *light* and *I bear*, and this element unites with the oxygen (*O*) of the air very slowly, and in so doing light is produced with practically no evolution of heat. You can buy from dealers in magical supplies luminous paint ready to use, with the proper varnish to thin it down.

Having prepared the face, take about 4 yards of cheese-cloth, tack it to a wall or other flat surface and then paint it over lightly with the rest of the luminous paint, which you have thinned down with a quart of the varnish. When the paint is quite dry, make a simple one-piece gown of the cloth, like a night-dress, only open in the back and with half a dozen buttons on it.

Now lay the false face and the dress in the sunlight for a day or so and you will find on taking them into the dark

that they shine with a ghostly radiance. This phenomenon is called *phosphorescence*, and it is caused by the luminous paint absorbing the light-waves and sending them out after the sunlight has stopped acting on it.

Next, cut out a square piece of black velvet, or canton flannel, and sew this to the top of the false face so that it will fall over the front or the back of it as you wish. Finally, make a black bag about 1 foot square and you have all the props for the materialization of *Mysteria*.

You must now look after your assistant and yourself. He must be dressed in a black canton flannel suit made like a baby's pajamas with feet in them and with a hood to match that completely covers his head, but having a couple of very small holes in it so that he can see out. He must also wear a pair of black gloves, and with this outfit on he will be quite invisible in the dark room. On the other hand, you must be dressed in either a white linen or a white flannel suit, so that you will always be visible in the aforesaid dark room.

Now just before you are ready to call this beautiful spirit from the vasty deep, fold the luminous cheese-cloth up neatly and put it into the bag, then leave it and the frame with the canton-flannel flap over the face in the outer dark room. As soon as the spectators are seated, turn out all the lights, and have your assistant bring in the wire frame and stand it silently against the wall. He then takes the luminous dress from the bag, and the audience will see it as a hazy patch of light.

As he unfolds it, the light gets brighter and larger, and as he buttons it on the wire frame it takes on the shape of

the female form, but it is headless. Slowly he draws the piece of flannel up and exposes the face, and *Mysteria*, as truly a spirit of the other world as ever was materialized, appears in all her wondrous beauty and effulgent glory, as in Fig. 164.

FIG. 164.—The Spirit of Mysteria.

But we are becoming spectrally sentimental again, and this will not do, for we must get back to the hard things of this earth. Your assistant grips the spirit near the place where her feet ought to be and holds her up; then he swings her, pendulum like, from one side to the other and finally lets her come to rest in a recumbent position with her front side to the audience, of course, and there she gracefully

rests until you command her to *dematerialize* and return to the place whence she came.

To perform this extraordinary feat, your assistant proceeds to take off her dress which he pins to the wall and leaves it there until he has taken the frame into the next room. Returning, he grips the dress and waves it in the air so that the audience sees the phosphorescent light high and low and everywhere at the same time. Finally, he gradually rolls the dress up and puts it under his arm when he makes his exit into the outer room. Then you turn on the lights and you will find the spectators nearly as pale but not half so beautiful as *Mysteria* herself. And thus chemistry, with a little physics thrown in, makes a spirit of a few poor "props."

CHAPTER XIV.

SAFE AND SANE FIREWORKS

EVERY year on the fifth of November the British celebrate *Guy Fawkes Day* with bonfires and fireworks just as we celebrate the Fourth of July, *Independence Day*, but, it is needless to say, for a wholly different reason. Guy Fawkes lived from 1570 to 1606, and he was the chief conspirator of the famous *Gunpowder Plot*, as it is called. This plot, which has ever since lived in history, was an idea that originated in the brain of one Catesby to blow up the Parliament House and in this way destroy King Charles I. On the fourth of November, which was the day set for the explosion to take place, Thomas Knyvett, a Westminster magistrate, discovered the plot and Fawkes was arrested. He was tried, together with his co-conspirators, the following January, and as he had no defense he was found guilty, and executed.

So the fifth of November is known in England as Guy Fawkes Day, and it is quite likely that our idea of celebrating Independence Day on the Fourth of July with bonfires and fireworks was taken from the old English custom that had its origin in the Gunpowder Plot. Be that as it may, you can do the following curious experiments with fire, flame, and smoke without danger if you stick to the directions, use no more of the ingredients than the formulas call for, and make them out of doors.

How to Make Fire Without a Match. Put 3 drops of glycerine ($C_3H_5(OH)_3$), *and no more*, in a pie-plate and then put 1 teaspoonful of crystals of potassium permanganate ($KMnO_4$) on top of it. In a short time the substances will react on each other, and then smoke will be evolved. If you have used the right amount of potassium permanganate ($KMnO_4$), the substances will begin to burn with a purple flame.

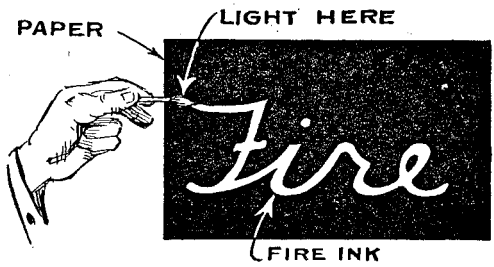

FIG. 165.—Writing with Fire Ink.

Writing With Fire Ink. This experiment should be made in a dark room, and is one that is quite out of the ordinary. Put a teaspoonful of water (H_2O) in a test tube, add ½ teaspoonful of potassium nitrate (KNO_3) and heat it over the flame of your alcohol lamp until the salt is dissolved. Now take a toothpick and write with the solution on a sheet of ordinary soft, porous paper, and make the lines heavy, with no break in the continuity of them.

When the paper is perfectly dry, take it in a dark room, then light a match and when it is burning well blow it out, so that only a kindling spark remains; touch the left-hand end of the writing with the match and the potassium nitrate

(KNO_3) will ignite and burn along like a fuse until the other end is reached, while the rest of the paper will not be burnt, as shown in Fig. 165.

Rapid Oxidation of Zinc. Here is another way to make a fire without a match, and this is by the rapid oxidation of zinc (Zn). Mix ½ teaspoonful of ammonium chloride (NH_4Cl) and 5 teaspoonfuls of ammonium nitrate (NH_4NO_3) on a pie-plate and then spread out the mixture in a thin layer. On top of this sprinkle 1 tablespoonful of powdered zinc (Zn) and then let a single drop of water (H_2O) fall in the center of it. The mixture will soon begin to burn, and the oxidation takes place so fast that the zinc (Zn) is ignited. It is the ammonium nitrate (NH_4NO_3) that supplies the oxygen (O) for the combustion of the zinc (Zn).

How to Make a Safe Fuse. Put a little water (H_2O) in a beaker and add as much potassium nitrate (KNO_3) to it as it will dissolve. This done, soak a soft, thick string in this solution for 10 or 15 minutes, and the salt will fill the pores of it. Now when you light one end of the string, it will burn slowly and steadily along until the other end is reached. All you need to do to make a time fuse is to use the right length of string, and this you can determine by making a trial or two.

How to Make a Flash-Light. Put ¼ teaspoonful of powdered magnesium (Mg) — no more — into the bowl of a tablespoon and hold it over the flame of your alcohol lamp, at the same time turning your face away from it; suddenly there will be a bright flash of light and in the spoon you will find a greyish powder. This substance is