you will not soon forget it, it may be the means of saving the life of one or more of those who read this lecture. Men who are accustomed to examine such places, perform experiments with a lighted candle before they risk their lives. Before going down into a well or old close cellar, they let down a lighted candle to the bottom, and if the candle goes out they know that this deadly gas is there and that any person who went into it would be suffocated. The well is only a large tumbler, and the experiment is only upon a large scale.

You will remember that good air after being breathed, became, in part, changed into *carbonic acid gas*, which is heavier than air, and which equally extinguishes flame and destroys life There are many changes which your sight will not detect, but we will endeavor to find them out by other means, you will now be able to understand how this air we breathe is composed of two different gases, of which I purpose to speak hereafter I have shown you that there is something in the air which is necessary to support life or fire. This is one of the two gases or elements of which I spoke just now. It is called *oxygen*, and has a great many very wonderful properties, which will delight you very much when you are able the make the experiment by which those properties are shown.

Hard steel wire will actually burn brighter than a gas light and almost as quick as a piece of string. If the candle that you dipped in the tumbler that contained *carbonic acid gas*, after being extinguished there, were to be dipped into a jar of this *oxygen* in its pure state, it would burst into flame again, and burn with a rapidity and brightness unknown to it in common air. Of these things I must talk to you another time. I hope you will not think my lecture too long and feel that you have added something to your little store of knowledge that will prove useful to you in days to come.

NEPHEW.

GRASSHOPPERS FOR DINNER.

We see by the American papers that Professor Riley and a few gentlemen have succeeded in "turning the tables" on the grasshoppers and locusts in a manner that those pirates will scarcely appreciate It is certainly a species of retributive justice that if the locusts will eat the crops, they must expect to be eaten themselves. At any rate at a dinner given by Professor Riley to a party of scientific gentlemen at St Louis, Missouri the "lively locust" formed the sole animal food. It is said to be a feast that the "veriest epicure might envy." Caloptenus soup was the first course, then hopper fritters—"vastly better than oyster fritters," and so on, through roast, boiled, fried, &c., till the final dish—"locusts served with honey." When the matter is considered without prejudice, there is no reason why the locust should be regarded as more repulsive than a shrimp, or even an oyster: it feeds on the best of vegetable food, and, according to Professor Riley and his friends, is itself really acceptable to the human palate. If the facts are as stated it is to be regretted that a ridiculous prejudice permits people to half-starve when food in abundance is within reach—in the very animals which have rendered the "short rations' an unpleasant necessity.

IMPROVED BALANCE FOR SCREW MARINE ENGINES SLIDE VALVES. —We give a sketch of an arrangement of balance for slide valves. The following will explain it:—A is the balance ram, B the slide-valve spindle, C the steam-chest cover, D the gland by which the balance is kept tight, E the dome, F a test-cock by which it may be ascertained if any steam is escaping from the steam-chest to the condenser, G the vacuum pipe. (Page 312.)

EFFECT OF ELECTRICITY ON PLANTS.—The effects of electricity on plants have not been closely studied. It is known to produce contractions in the Mimosa and other sensitive plants, and to retard the motion of sap. M. Becquerel has studied its influence on germination and development. It decomposes the salts contained in the seed, the acid elements being carried to the positive pole, and the alkaline portions to the negative. Now, the former are hurtful to vegetation, while the latter favour it M Becquerel further examined the influence of electricity on the colour of plants The discharge from a powerful machine produce remarkable changes of colour on the pedals, due, he thinks, to the rupture of cells containing colouring matter. Deprived of this cellular envelope by washing, the floor becomes white.

THE REFLECTION OF LIGHT.—An almost exhaustive historical essay, by Lundquist, on the investigation of earlier physicists into the peculiarities of the light reflected from the surfaces of solid bodies, is supplemented by observations made by himself on the reflection from fuchsin, and some other substances. The methods followed by him were similar to those adopted of late years by Jamin, Wiedemann, Van der Willigen, and others. A narrow pencil of sunlight, reflected in a fixed horizontal direction from a heliostat, passes successively through an achromatic lens, a flint glass prism, and a polarising Nicol's prism, and falls upon the reflecting surface of fuchsin; the reflected light is then analysed by a compensator, and second Nicol's prism. Rays of light from seven different portions of the spectrum were examined, and in general Lundquist concludes that in respect to the principal angle of incidence fuchsin comports itself as does indigo; and the observations are represented by the theoretical formulæ for metallic reflection so long as the angle of incidence is greater than 59°. The author's investigation into the intensity of the reflected light shows that in one hand the intensity is always slightly less than that computed, and that on the other hand the quantities reflected vary sensibly with the colour of the incident light—so that when light falls upon the fuchsin the color of the reflected varies with the angle of incidence; and the power of the substance to absorb different coloured rays offers a remarkable anomaly—as, while the yellow light is reflected in greater proportion than the blue, it is absorbed in less proportion.

A PUBLIC READER SAYS:—It is some years since I began reading in public, and one of the first lessons my experience taught me was that I could not secure the attention of my audience, neither could I make the points of my story tell, while my attention was taken up by the fear of bad elocution. There are several things which I found essential to success. To put them briefly: 1. The selection of a reading containing merit and interest of its own apart from the reader. 2. A thorough knowledge of the piece I am going to read. I never read a piece in public until I have thought over its purpose, and got off its strong points in private. 3. The power to lose my own identity in what I read, expressing the meaning not only with the voice but with the eye also. This requires a little study, but the power it gives to a reader is invaluable. I have heard (or seen?) some of the finest works in the English language fail in producing the least effect simply because the reader's eyes were buried in his book. 4. As to the voice, I always commence a reading in a low but clear tone, every word being distinctly uttered in slow time. This gains the ear of your audience. You can then increase both the pitch of your voice and the time also, but never hurry. If the reading be lengthy, an occasional return to your key note will afford an agreeable rest to the listeners.

A NEW CEMENT—A French chemist is said to have succeeded in preparing a mineral compound, which is said to be superior to hydraulic lime for uniting stone and resisting the action of water. It becomes as hard as stone, is unchangeable by the air, and is proof against the action of acids. It is made by mixing together 19lb. of sulphur and 42lb. of pulverised stoneware and glass. This mixture is exposed to a gentle heat, which melts the sulphur, and then the mass is stirred until it becomes thoroughly homogeneous, when it is run into moulds and allowed to cool. It melts at about 248° Fahr., and may be re-employed without loss of any of its qualities, whenever it is desirable to change the form of an apparatus, by melting at a gentle heat, and operating as with asphalte. At 230° Fahr. it becomes as hard as stone, and preserves its solidity in boiling water.