Hemming has, indeed, in a measure prevented this, by filling the interior of the brass pipe through which the mixed gases pass, with thin copper or brass wire; but still accidents may very easily arise in unskilful hands. It is, therefore, much better to burn the gases by means of the jet contrived by Mr. Maugham: by this contrivance, the gases are only mixed just as they issue from the mouth of the jet, so that it is impossible that any explosion should take place. Each gas is confined in a separate gassbag, made of the strongest India-rubber cloth of Mackintosh, and a pressure is given by the application of weights on the boards which rest upon the bags. I will now turn the stop-cock connected with the hydrogen, and ignite the gas as it issues forth. You will observe that the flame burns in an irregular manner, and that its edges are jagged. I will now turn on the oxygen. Observe the immediate difference: the jagged edges are at once gone, the flame is now sharp and pointed. We have in this little flame the most powerful heat that chemists can produce.

The most refractory clays, and gems of various kinds, as the ruby, the sapphire, the amethyst, &c., melt with the greatest ease in this flame. The diamond is immediately dissipated and lost. The metals all burn with remarkable brilliancy in this flame. I have here a piece of steel wire. I will introduce it into the flame, and you will see it immediately melt, and burn with the most vivid scintillations. I will now turn off the hydrogen, and allow the oxygen only to play upon the white hot metal. You perceive the scintillations are immediately increased, and that the effect is most brilliant.

(Mr. Nesbit then exhibited the combustion of various metals, such as zinc, copper, bismuth, tin, lead, antimony, &c.: the whole of which burned, in the gas, in the most brilliant manner, at the same time exhibiting as they burned various and beautiful colours.)

Mr. Nesbit then proceeded:—The flame of this blow-pipe exhibits very little light, though it produces so great a development of heat. You may be surprised at this; but it only requires the presence of some solid matter to produce the most brilliant light. If you pass common air through red or white hot tubes, the hot air issuing exhibits no light; but any solid body immersed in the current becomes red or white hot immediately.

The common candle and gas exhibit their light, in consequence of the particles of solid carbon which exist in their respective flames.

I will allow the jet of gas to play upon a piece of common tobacco-pipe. An intense light is immediately produced, and the pipe is melted, and converted into a sort of sapphire, which cuts glass with the greatest ease.

If we had any solid substance which could stand the heat of this flame without melting, we should then be in possession of the means of making the light continuous. Common lime happens to be a substance so refractory that it withstands very well the action of this flame.

I will now allow the jet to play upon a cylinder of lime. The light produced is most intense. The whole room is illuminated. But perhaps the best insight into the intensity of the light may be had by observing that the *flame* of the candle is actually *shadowed* against the wall.

This light has been proposed to be used for light-houses; and, with proper reflectors, can easily be distinguished at the distance of twenty or thirty leagues.

Though my object is not half exhausted, I must draw my lecture to a close. I have to thank you for your attention, and I trust you will endeavour to get practically acquainted, by reading and experiment, with all the properties of oxygen. Many things which I have found it necessary to present in this lecture may appear to you not quite relevant to the subject of agriculture; but allow me to state, that if at any time you wish to know the real boundaries of a kingdom or a country, you must constantly have recourse to a point of view from a neighbouring district.

HOW MUCH SHOULD THE PEOPLE HAVE TO EAT?

On the 17th February, 1846, Mr. George Kildy, of Quensborough, Member of the Royal Agricultural Society of England, proposed the following question for discussion at the Leicester Athenæum:—"The inhabitants of England and Wales are sixteen millions: what quantity of flour, butcher's meat, and ale, would each require daily (with the daily and yearly amount for the whole population) to nourish and keep up the body to an healthy standard?" On the 24th Mr. James Anderson, surgeon, &c. of Leicester, opened the discussion with the following paper:—

"Before we approach the question for discussion, let us inquire what the body requires for its formation and to supply its constant waste. The elements of the food of man are carbon, hydrogen, oxygen, nitrogen, phosphorus, sulphur, iron, chlorine, sodium, calcium, potassium, magnesium, and flourine. By the union of two, three, four, or more of these elements, are formed certain substances, which, on account of their use as food, may be denominated "alimentary principles." These are waters, sugar, gum, starch, pectine, acetic acid, alcohol, oil or fat, vegetable and animal albumen, fibrine, caseine, gluten, gelatine, and chloride of sodium (common salt). These alimentary principles, by their mixture or union, form our ordinary food which may be called "compound aliments." Thus, wheat consists of starch, gluten (vegetable mucilage), sugar, gum &c. Meat is composed of fibrine, albumen, gelatine, fat, &c. A living body has no power of forming elements, or converting one elementary substance into another; therefore, the elements of which the body of an animal is composed must be elements of its food. Nitrogenized foods are alone capable of conversion into blood. And of forming organized tissues; that is, in fact, they only are the "food," properly so called. Leibeg calls them, "the plastic elements of nutrition. The non-nitrogenized foods are incapable of transformation into blood; they are nevertheless essential to health; their functions are to support the process of respiration, and some of them contribute to the formation of fat.

Nitrogenized Foods, or Plastic elements of Nutrition are—

		Per centage of Nitrogen.
Proteine (1) Compounds.	Vegetable Fibrine,	15.809
	Ditto Albumen (of wheat)	15.920
	Ditto Caseine,	15.672
	Animal flesh (beef roasted)	15.214
	Ditto blood	15.08

Non nitrogenized Foods, or elements of Respiration are—

Fat	Sugar of Milk
Starch	Pectine (vegetable jelly)
Gum	Wine
Cane Sugar	Beer
Grape Sugar	Spirits

"Nutrition is the grandest gift of nature, and the common and highest prerogative of the animal and vegetable kingdoms, by which they, beyond measure surpass all human machines. No artist can bestow the faculty, not to say of increasing and coming to perfection, but even existing independently, and repairing the incessant loss incurred from friction. By the nutritive faculty of the body its greatest and most admirable functions are performed; by it we grow from our first formation, and arrive at manhood; and by it are remedied the destruction which incessantly occur