you place a lighted candle. The result from the union of C with O of the air is CO_2 which may be tested by shaking it up with lime water as described in a former lesson. When the water assumes a milk-like appearance. The same explanation applies to the flame of a coal oil lamp. The brighter light is owing to the C and H of the oil being in a state to unite more freely with the O of the air. If it is thought that the air has nothing to do with the continuance of the flame, just stop up the little holes in the burner and note the effect; or cover the top of the chimney and observe the same effect. A similar result is commoner from closing up the damper of a stove. Covering the top of the house chimney has a similar effect to covering the top of the lamp chimney. In the case of the lamp, why does the flame go out? You say that it is owing to the draft being closed off. But why should that make any difference? Well, when the draft is off, there remains only a limited amount of air to supply the O that supports the flame, and when this O is exhausted, of course the light vanishes, just as our life would vanish were we confined to a limited atmosphere. You will notice that a large quantity of smoke comes off before the light, and for a time after the light goes out. Why is this? The heat produced by the flame has been setting free the C and H of the oil and continues to do so for a little after the light is out, but having no O to unite with, passes off in smoke. The black smoke that we see is unburnt C. Were you to heat it sufficiently by a flame in the presence of air or O it would burn up, forming CO_2 accompanied with heat. When you light a fire, you notice very much more smoke than after it has burned for a while. The same thing is observed when fresh fuel is thrown into the furnace of a locomotive or that connected with a factory. Now it always requires a certain amount of heat to enable C and O to unite. When wood or coal is first lighted there is sufficient heat to liberate large quantities of C from the wood or coal but not enough heat to cause it to chemically unite with the O of the air, and it must pass away unused, and in the form of smoke. Little by little the chemical union goes on, the heat increases, and finally the union is rapid and general, provided the air has free access to the C in the flame. This smoke as it is unburnt C, is capable of being burned and of producing heat and light. You may form some kind of an estimate then as to the immense amount of heat and light that is lost through smoke. If we could always have a sufficient quantity of air or O at the proper temperature in the presence of a flame, we would have no smoke. Some manufacturies have appliances connected with their furnaces, by which O and heat are supplied in proper amount and degree, to consume nearly all of the C, and thus a great saving is effected. W. G. B.

WHERE ENGLAND IS GREAT.

With reference to the continental complications and increase of armies and extension of military preparations, Right Hon. Edward Clarke, Q.C., Solicitor-General, in a speech recently, declared himself plainly, denouncing it all as a scandal and disgrace to civilization and a perpetual menace to the peace of the world. While England would always defend her interests and honor, she would engage in no rash and adventurous experiments. She found her support as guardian of European liberties in Australia, Canada and her kinsmen of the the United States, and these would enable her to defy the combined powers of Europe.—[*The Englishman's Journal.*