may be mixed with the flour, and converted into a pasty soap by boiling, and the soap may be dissolved therein instead of being melted separately. The mixture when well incorporated is to be removed from the fire and stirred till it has cooled to about 140° F., when 8 oz. of turpentine, mineral naphtha, camphine, benzol, or some other equivalent substance must be added, together with a saturated solution of carbonate of ammonia. The whole must then be again well stirred, and the mixture run off into suitable vessels, closed air-tight. About half an ounce of the liquor ammoniæ of the London Pharmacopœia may be added to every four ounces of the saturated solution of the carbonate. In place of the dextrin, flour and other farinaceous substances above mentioned, an equivalent quantity of gelatine, glue, or other mucilaginous or gelatinous substance may sometimes be used. For making a detergent composition for common use, common mineral or coal tar naphtha, or turpentine, may be the hydrocarbon used, and a larger quantity of caustic ammonia may then be advantageously added; but, for a detergent preparation for toilet purposes, or for washing or cleansing body linen, it is preferable to use the best rectified camphine, or some analogous material of more agreeable odour. The carbonate of ammonia may also be added to the pasty saponaceous mixture in the dry pulverised state, in the proportion of a quarter of an ounce to every pound of soap. When it is to be used for washing linen, about four ounces of the mixture should be added to about twelve gallons of water, and stirred till quite dissolved. The clothes may be put in and stirred with a stick, after which they may be boiled for a few minutes and then rinsed in fresh warm water.—*Chemical Technology*, by Richardson and Watts.

The Bathoreometre.

M. J. Giordano has described to the French Academy of Sciences an instrument, called by him a *bathoreometre* (depending, as to principle, on the closing of an electrical circuit by means of a substance interposed between the electrodes), whereby he is able to determine, with great exactitude, the thickness of very thin substances. A single thread of the silkworm was found to have a thickness of 0·014 of a millimetre; that of a spider (such as is used to divide the field of the telescopes), 0·037 mm. Hair from an infant's head is 0·009 mm., that of an adult averages 0·047 mm., in thickness. French gold-leaf has a thickness of 0·009 mm. A film of mica was obtained so wonderfully thin as 0·003 of a millimetre, or about twelve-millionths of an inch.

The Tobacco Question.

The London *Athenæum* thus puts out the pipe of a clergyman who has written a love story entitled "What Put my Pipe Out?" and in it gives eight reasons for the disuse of tobacco:—"Unless we are mistaken his eight reasons (we may remark, by the by, that six is the right number of reasons to go to the enlightened public with) will not leave much weight with those who love the gentle weed. Let us put them before our readers, editing each with a brief note: '1. It is a practice borrowed from savages' So also are other usages, such as personal decoration, and the habit of distinguishing men of rank by clothing them with authority—usages not branded as odious because of their origin. '2 It is a practice which generally begin with us in youth, when the reason is not matured.' At the same period men begin to indulge in manly sports, strengthening themselves in the habit of speaking the truth, and mark out for themselves careers of noble enterprise. The fact that the habit began in youth can scarcely be accepted as proof that a man's habitual industry is injurious to him. '3. It is an offence against the natural instincts of society, especially against ladies, who have not been vitiated by its use. The natural instincts of society surely cannot be offended by a usage 'borrowed from savages, living in that degree of civilization which borders most closely on what is vaguely termed 'a state of nature;' moreover, what right has the non-smoker to assume that ladies who do not object to smoking are vitiate? '4. Disinterested medical men say it is productive of many physical and mental diseases.' On the other hand, disinterested medical men say that moderate indulgence in tobacco is either harmless or beneficial. '5. The growth of it uses up valuable land for its cultivation which might be better employed for corn.' Might it be better employed? The author settles the question by assumption, not proof. Teetotallers offer a similar objection to the culture of the vine, and vegetarians in the same way denounce the system which allots so much of the earth's surface to graziers. '6. Our natural tastes, which are usually good judges in such cases, reject it at first, until overcome by habit.' Until it has been educated to enjoy them, the pallate rejects the most exquisite as well as nutritious dishes. '7. Many philanthropists say smoking leads to drinking.' On the other side, many philanthropists know the reverse. Smoking has become more and more fashionable in English society just in proportion as deep drinking has fallen into disfavor. '8. Tobacco costs money.' Dogmatic treatises against a usage countenanced by a large number of the wisest and best of our race, cost their readers time and temper, as well as money.

Lighting Cities.

An ingenious Frenchman has discovered a most economical way of lighting cities, and proposes to apply it to Paris. Balloons, from the cars of which are to emanate an electric light, are to be fixed at certain stations, and hover over the city, at the proportion of one balloon to 80,000 persons; the city would be lighter at night than it often is in winter by day.

Flax Cotton.

A flax cotton mill is fitted up at East Toledo, Ohio, which is expected to consume 4,000 pounds daily of raw material, and produce 2,000 pounds of cottonized flax. Eastern satinet manufacturers have agreed to take it all.

Trial of Armor Plates, Steel Guns, &c., at St. Petersburgh.

Further trials at St. Petersburgh with the experimental 19-inch rifled cast-steel gun. The London *Times* states that this gun is of solid cast-steel,