

### Candles and Candlemaking

THE science and art of illumination are nothing if not progressive and the displacement of the candle, emblem of humble domesticity and spiritual occasions, by other forms of light is but one of the inevitable consequences of modern progress. Candle manufacture is casually regarded as a minor industry to-day, but such is actually not the fact as Mr. David Allan showed in his paper on this subject before the Institution of Petroleum Technologists on February 14. The candle has had a firm place in history and religion since ancient times. Its simplicity of construction and self-contained character have commended it for use in diverse circumstances where soft and easy illumination have been required. Essentially a cylinder of fat or wax enveloping a fibrous core or wick, cast in various shapes and sizes, its form has varied but little throughout the ages. Attention latterly has been paid chiefly to efficiency and cheapening of methods of manufacture, while a measure of artistic evolution is discernible in the shapeliness of form and decorative effects achieved in the modern product. The candle industry, in so far as it relates to manufacturing process, is a comparatively straightforward matter, but the technology behind it is by no means so simple. The author has done good service, not only by presenting a comprehensive account of the subject, but also in describing the essential technology. While the petroleum industry cannot claim the candle as entirely its own product, the paper shows clearly that this article of commerce is by no means one of minor importance, and the link between hydrocarbon oils and saponifiable fats and waxes is once again well illustrated by its technical study and description.

### Safety of Life from Fire

A USEFUL lecture given by Col. G. Simonds at the Royal Society of Arts on "Safety of Life from Fire" is published in the Society's *Journal* for January 20. The figures given prove that the fire risk to individuals is not large, but as the risk can be almost eliminated by a few simple common-sense rules, it is advisable that they be taught in schools. The best way of doing this is by showing films illustrating the principal dangers and the methods of avoiding them. The dangers to life arise mainly from the products of the fire, namely, smoke and hot gases. During a fire, it is a safe rule never to open a door if a fire is raging the other side. If it is necessary, and the door opens towards you, one hand should be placed on the handle and the other shoulder high on the door. The door can then be opened safely about three inches, the opener being protected from the smoke and gases and so see something of the surroundings. If necessary, the door can be shut quite easily. To go through smoke one should crawl on the hands and knees keeping the mouth as close to the floor as possible. When coming down a staircase through fire or smoke one should keep as close to the wall as possible and if it is necessary to crawl, come down feet first. A person whose clothes are on fire should never be allowed to remain standing for

a moment. Fatalities nearly always arise from the shock of burning about the face and head. If they should start to run they should be tripped up and rolled on the floor in a coat or a blanket if possible. The new tannic acid treatment for burns has proved very successful, as shown by Dr. Philip H. Mitchiner in his Hunterian lecture delivered before the Royal College of Surgeons on February 1 (*Lancet*, Feb. 4, p. 233). The results of its use show a very decided percentage drop in the number of fatal cases. People should be warned about the dangers of cleaning with petrol as the number of fatalities due to this cause is increasing.

### Ultra-Short-Wave Radio Research

Two papers, communicated by the General Electric Co.'s research laboratories at Wembley, were read to the Radio Section of the Institution of Electrical Engineers on January 4 by Mr. E. C. S. Megaw. The first paper gives a critical summary of the existing knowledge of electronic oscillations. The methods of their production are outlined and their applications to radio communication are described. Using these oscillators and parabolic reflectors, Beauvais obtained in 1930 a maximum range of telegraphic transmission of about 25 miles from the top of the Eiffel Tower. In the Dover-Calais demonstrations of the International Telegraph and Telephone Laboratories (March 31, 1931) duplex telephony was achieved over a similar distance. In the second paper, possible methods of utilising magnetrons to generate short-wave oscillations are indicated and the more important of the results obtained by previous workers are described. Experimental investigations were undertaken to discover the relations between electron and dynatron types of oscillation. For electronic oscillations it was found that the experimental results are entirely in agreement with theory in those cases where it is applicable. The investigation of the simple dynatron oscillations showed that the static characteristics exhibited a negative resistance effect. During oscillations it was found that the anode current may exceed the original total emission current. This is considered to be due to the bombardment of the filaments by electrons which return to it with considerable velocity. The shortest wave-length obtained by means of dynatron oscillations was about thirty centimetres. At this wave-length the power attainable was about a tenth of a watt. It is concluded that for wave-lengths less than about fifty centimetres electronic oscillations give the greatest output.

### Mortality from Whooping Cough

IN a paper read at a meeting of the Royal Statistical Society on February 21, Dr. Bradford Hill pointed out that, in modern times, mortality from whooping cough in England and Wales has shown a remarkable decline, the death rate in the years 1921-30 being only one-third of that recorded in 1861-70. In spite of this improvement it remains a very important cause of child mortality. In 1921-30 it was responsible in England and Wales for no less than 44,000 deaths,