

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,

or nearly 1 per cent of the total mortality of the population. The mortality falls mainly upon the first two years of life, while, in 1921-30, more than 90 per cent of the deaths were concentrated on the first five years, a ratio which was equally true at the end of the eighteenth century. In view of this concentration upon very young children, steps to control it are earnestly to be desired. One of the most curious anomalies of whooping-cough mortality, which has long been recognised, is the consistently heavier mortality of female children. Various attempts have been made in the past to explain this, for example, in terms of the sex differences in the formation and development of the larynx, sex differences in sensitiveness of the nervous system, but none of the hypotheses so far put forward seems, on careful examination, to be adequate.

ANOTHER curious feature of the mortality of infants from whooping cough is the lower death rates of illegitimate infants, when compared with the legitimate, in the first three months of life, while at the same age lower death rates are found in urban districts when compared with rural. An abnormal characteristic of the epidemiology of the disease, that has existed for at least three quarters of a century, is the increasing proportion of early deaths with decreasing urbanisation. This feature of the disease is not shown by measles. The latter acts according to 'expectation', namely, the more the 'overcrowding' the earlier the liability to attack and death. Yet whooping-cough statistics for England and Wales suggest the reverse. The relative importance to-day of whooping cough as a cause of widespread sickness and death is perhaps still under-rated, and further steps to combat it are required.

British Claims in the Antarctic

By an Order in Council dated February 7 and published in the *London Gazette* of February 14, a sector of the antarctic comprising an extent of one hundred and fifteen degrees of longitude and covering more than a quarter of the antarctic continent has been placed under the authority of the Commonwealth of Australia. The *Times* reports the order as stating that "that part of the territory in Antarctic Seas which comprises all the islands and territories other than Adélie Land situated south of the 60th degree of South Latitude and lying between 160° E. and 45° E. is territory over which His Majesty has sovereign rights". The order comes into force when the necessary legislation has been passed by the Commonwealth Parliament. Adélie Land was claimed by France in 1924 but its boundaries were not defined. The new territory adjoins the Ross Dependency of New Zealand on the east and extends from Oates Land through King George, Wilkes, Banzare, Knox, Queen Mary, Wilhelm, and Mac-Robertson Lands to Enderby Land, beyond which Norwegian discoveries link it to Coats Land. The coasts of most of the territory were discovered by British, including Australian, and American explorers. The glaciated interior is unknown. No one name is

in use for the whole of the area. The only commercial value of the coasts is for whaling.

The Shrimp Industry of Leigh-on-Sea

UNDER this title Mr. A. Laurence Wells has written a long and comprehensive account of this once important industry of the Thames Estuary (*Southend Standard*, Dec. 29, 1932, Jan. 5 and 12, 1933). Unfortunately, shrimping at Leigh has steadily dwindled since the beginning of this century. From six boats in 1832, the numbers rose to a hundred in 1850 and two hundred in 1875, dropping from 1905 to the present time, when there are only sixteen shrimpers among the forty boats engaged in fishing activities. These records of a vanishing industry are well worth preserving and Mr. Wells with the help of the manuscript notes now safely preserved in the Southend Museum made by the late Dr. James Murie gives us a most interesting survey both historical and biological. The term 'shrimp' embraces several species which are all described and differentiated. Thus from this district we have the common 'brown shrimp', the original shrimp of commerce, at first the only kind fished; the 'banded shrimp', the 'yellow shrimp' and the 'channelled shrimp'. Besides these true shrimps there is the 'pink shrimp' which, though not a prawn, is prawn-like, and four species of real prawns. Finally, there is *Nika edulis*, the so-called 'Risso's shrimp' which, although rather rare, is very good to eat. Each of these has its own individual habitat. Their life-histories are different and the fisherman knows a great deal about them which is not known to the general naturalist. There is much valuable information in this series of articles which all interested would do well to study.

Aquaria

THE importance of observing the hydrogen ion concentration in the aquarium is now fully recognised. Both the *Aquarist and Pond Keeper* of January-February 1933, and the *Aquarium Review* of December 1932, include articles on this subject ("PH Values, Their Meaning and their Significance to the Aquarist", by J. F. Corrigan. "The Aquarium and pH" by L. C. Mandeville). The same number of the *Aquarist* contains notes from the Brighton Aquarium by the Curator, Mr. George W. Weller, and notes from the Zoological Society's aquarium by the Director, Mr. E. G. Boulenger. In the Brighton Aquarium there are now living one hundred and twenty herrings; also an angler, *Lophius piscatorius*, which is very difficult to keep alive and one of the most voracious of all fishes. Mr. Lester L. Swift gives a very interesting account of the American tropical fishes belonging to the genus *Mollienesia*, and how to keep and rear them. These fishes are viviparous but somewhat difficult and irregular in breeding in captivity. They require much vegetable food as well as animal, and a certain kind of slimy alga, known as 'frog-spit', is apparently essential to the raising of healthy broods. A female may have 2-10 young every few days for a month or she may have a litter once a year or once a month for several months in succession.