mean of at least two analyses, which were generally made on a mixed sample consisting of several specimens.

Only a few points can be referred to here. In the analytical procedures it is of interest to note that the authors used bromine to deproteinise their aqueous extracts. Examination of the figures obtained showed that the percentage deviation from the mean in the case of protein was 6–10, in the case of fat 30–45 and in the case of the salts 7–20. The dangerous errors in working with food tables, however, are first the systematic analytical ones and secondly the use of inappropriate tables, for example, those showing raw composition when the food is actually eaten cooked.

All the fish commonly eaten in Great Britain have been analysed: it was found that the white fish have on the whole a uniform composition. The purine content of whitebait was found to be high and only surpassed by that of soft roes and sweet-breads. Smelts, herring and whiting are also rich in purines. Sprats, sardines and whitebait may be a valuable source of calcium, since the bones are small and usually eaten. The winkle is peculiar in containing a very large amount of magnesium. The phosphorus content of foodstuffs depends largely on the amount of edible bone or nuclear material present.

The third section of the report is devoted to an experimental study of the losses brought about by cooking: the losses were determined at intervals after the beginning of cooking, so that the results can be expressed simply in graphical form. Beef and fish were chiefly studied, but there is no reason to suppose that other meats will behave differently. It was found that beef, when fully cooked, loses the same amount of weight, water and salts, whether the cooking is commenced in hot or cold water. When the temperature is raised to 60° C. all flesh foods shrink, owing to shrinkage of their proteins and the expression of juices. This is the only cause of salt loss when meat is heated in steam or air; in water, some salts are also lost by diffusion into the water. The extent of the shrinkage of beef, fish, kidney and liver proteins is little affected by raising the temperature from 80° to 100° C., but is slightly increased by a further rise to 120° C. Brain does not shrink below 80° C.; tripe shrinks when the temperature is raised from 80° to 100° C. Fish muscle loses weight in watery solutions below about *p*H 5·6 and gains weight at higher *p*H. Beef tends to gain weight at all *p*H values, especially below 4·5 and above 6·5. Acids and alkalis inhibit the heat shrinkage of muscle proteins. In fish, shrinkage is greatest at *p*H 4·0–4·5 at which loss of weight on soaking is greatest; in meat, shrinkage is greatest at about *p*H 6·0. It is suggested that the chief protein in fish has a more acid isoelectric point than that of beef. Shrinkage on heating is not so rapid nor so extreme just after death as it is 40 hours later. In heating by steam, 50 per cent of the water and salts of beef may be lost and a still higher percentage in kidneys. On lowering the *p*H of the cooking medium, meat and fish tend to lose more of their cations and less of their anions; fish juices are more alkaline than those of beef, and fish lose relatively more of their anions than meat on cooking in water.

In roasting, the loss of water is nearly all due to evaporation; the loss of salts is small, because when the juices are expressed and the water evaporated, the salts are left on the surface. Frying in deep fat leads to such rapid evaporation of water that the loss of salts is at a minimum. Loss of fat is due to liquefaction of the fat by the heat so that it runs off the meat; shrinkage of the proteins has little influence on the loss of fat.

The authors' experiments have led them to conclude that 'pressure cooking' has no advantage over steaming at 100° C., however economical it may be in time and fuel. Compared with heating in water, both methods have the advantage that all loss due to leaching out of soluble constituents is avoided. Salt losses in fish are greatly reduced by steaming, but with larger pieces of meat the losses are similar whether the meat is cooked in water or steam. No evidence was found that a pellicle forms on the outside of a joint when cooking is commenced at a high temperature; this procedure can only be supported on grounds of palatability or digestibility. Undercooked meat is probably not more nutritious than overcooked meat; in any event the latter is a more concentrated food, since the greater part of the weight lost in cooking is water.

News and Views

The Lost Fragrance of Musk

THE total disappearance within recent years of the scent of musk, *Mimulus moschatus* Dougl., is one of the most puzzling of plant phenomena. A native of North America, it was introduced into Great Britain from British Columbia in 1826 by the botanist David Douglas. It quickly became a garden favourite, and the yellow, rather insignificant flowers are still a familiar sight in cottage windows. The plant has become naturalised in certain parts of the British Isles and in New Zealand, where it was taken by the early settlers. At the beginning of the present century, the sweet-smelling musk was hawked from door to door in London suburbs. So far as records are available, it appears that the loss of fragrance was first noticed in Britain in 1909, when a well-known nurseryman asked: "Is there such a thing now as a common Musk with the old Musk perfume? Many friends of mine contend that there is not, and I myself am sceptical." Vilmorin, however, in "Les Plantes de Pleine Terre" (fifth edition, 1909), describes the musk as a "petite plante poilue et visqueuse, exhalant une forte odeur musquee, qui se sent a une grande distance", which suggests that

the 'mutation' had not been noticed in France at that date, and there is evidence that in some localities the failure to produce the characteristic perfume was not generally apparent until after 1916.

DURING the years that followed, it was believed that this failure to produce the 'musk' smell might be ascribed to some adverse condition of cultivation, and it was not known how world-wide was the phenomenon until Sir Arthur Hill, director of the Royal Botanic Gardens, Kew, in his presidential address before Section K (Botany) of the British Association in 1930 at Bristol, stated that, as a result of exhaustive inquiries in Great Britain and in western North America, it had been established that plants of musk with the old-fashioned and distinct fragrance were no longer to be found, even in their native habitat. Correspondence with New Zealand shows that the same thing has happened in all the stations where the plant was previously known to have been scented. Periodically reports reach Kew that the old scented musk has been rediscovered; unfortunately, the statements cannot be substantiated, and seeds submitted produce scentless plants or fail to germinate. Many ingenious suggestions have been made to account for the disappearance of the odour of *Mimulus moschatus* Dougl., but, so far, no conclusive theory has been offered.

Cancer Research

THE eleventh annual report of the British Empire Cancer Campaign, presented at the annual general meeting on July 9, contains summaries of a great variety of researches of different kinds, carried on in a number of laboratories and hospitals. Two of them are of particularly general interest. At the Middlesex Hospital, Prof. J. McIntosh has shown that tumours produced in fowls by the action of tar may be filtrable, that is, they may be transmitted from bird to bird by an ultramicroscopic agent which has many of the characters of a virus. In this way, the artificial tumours resemble those which spontaneously occur in birds, and filtrability seems to be a general property of bird tumours, irrespective of their mode of origin. The common-sense interpretation of this is that the virus-like agent arises in the tumour and does not come into the body from outside. At the Cancer Hospital, Prof. E. L. Kennaway, Dr. J. W. Cook and their colleagues have carried their brilliant work on carcinogenic chemicals a good deal further. Having at last identified at least one of the effective substances in tar, they have studied allied compounds and derivatives and have established what may be called a carcinogenic constitution, so that the probable action of any substance may to some extent be predicted from its structural formula. All this helps to rationalise the overwhelming hygienic case against tar and soot as causes of external cancers: it seems possible also that it may explain the origin of some internal cases, for some of the active substances are related to the sterols, bile acids and œstrin, which are normal components of the body. Conversely, as Prof. E. C. Dodds has shown, some substances which produce tumours are also effective in causing œstrus and sex changes in the plumage of birds.

A New Radioactive Element beyond Uranium

THE Czechoslovak newspapers reported on July 5 that an element of higher atomic weight than uranium has been discovered in Joachimsthal pitchblende by Dr. O. Koblic. The element has been assigned the atomic number 93 and its atomic weight has been found to be 240 from an analysis of the silver salt, $Ag(93)O_4$. The new element would be a congener of manganese and of rhenium, which was discovered in 1925. It should thus form an acid analogous to $HReO_4$ and also salts similar to the permanganates and perrhenates. Acting upon the supposition that the sodium salt of $H(93)O_4$ would be very soluble, Dr. Koblic concentrated the mother liquor from the alkali treatment of pitchblende in the extraction of uranium and radium compounds, and the acidified filtrate was precipitated first with silver nitrate and finally with thallium nitrate. This gave the expected $Tl(93)O_4$ as a red crystalline precipitate. It was re-converted into the more soluble yellow silver salt, 115 milligrams of which were obtained. The discoverer has suggested the name "Bohemium" for the new element, which he considers is probably the parent element of protactinium and the disintegration products of the actinium series. It is estimated that crude pitchblende contains about one per cent of the new element. It will be recalled that Prof. E. Fermi, of Rome, who is investigating the products of neutron bombardment of various elements, recently reported the discovery of an element of atomic weight exceeding that of uranium (see NATURE, June 16, p. 898).

Low Temperature Exhibition in the Science Museum

THE Science Museum—the National Museum of Science and Industry at South Kensington—has made for itself an enviable reputation by the special temporary exhibitions held in the past few years to illustrate the progress which has been made in various branches of science and technical industry. The most recent exhibition, which comes to an end on August 31, shows the public the principles and applications of refrigeration. In the original scheme, it was intended to include a few exhibits to show the progress which has been made in very low temperature work from the days when Faraday demonstrated that certain gases could be liquefied. It was soon realised, however, that the subject was too big and too important to be included merely as a branch of the present exhibition, and it was decided to devote to it an independent exhibition. As the result of a meeting arranged by Col. E. E. B. Mackintosh, director of the Science Museum, of scientific workers, industrialists and representatives of Government institutions interested, to consider the proposal, a small committee has been appointed to decide upon suitable exhibits. The exhibition will commence in March 1935 and will be on view for two months. The arrangements will be in charge of Mr. T. C. Crawhall, the officer of the Museum who was responsible for arranging the present refrigeration exhibition.