Calendar of Nature Topics

January freeze-the-pot-by-the-fire

January, the coldest month of the year in England, is proverbially associated with snow and ice. In the French Revolutionary Calendar of 1793, the period from December 21 to January 19 was the month 'Nivôse' or 'snowy'. During the twentieth century, however, January has not lived up to its name, but has been much more open, mild and stormy, with few prolonged frosts. At Greenwich the mean January temperature during the decade 1921–30 was 41·3° F., more than 2° F. above the long-period normal and probably 5° or 6° higher than in some of the decades of the late eighteenth and early nineteenth centuries. This persistent period of mild winters has extended over the whole of western and central Europe; it is associated with a greatly increased frequency of south-westerly winds and may almost be regarded as a change of climate.

Life in the Southern Atlantic Ocean

"January 1—Wilson's petrels, two kinds of prion petrels, albatrosses and a bosun bird were observed to-day. Sun-fish (*Orthagoriscus mola*) were also seen; at 2.30 p.m. a boat was lowered to get one. After several ineffective attempts at harpooning we managed to stun one with shot. Davidson after a while drove the harpoon into the gills, and we then made fast to one of its fins and towed it to the ship. Three or four sucker-fish accompanied it to the boat, and on cutting the sun-fish up, one was discovered in the gills. A parasitic copepod (*Argulus*) was found externally, as well as a polyclad. There was also a parasitic copepod on the gills and a barnacle on the lip. In the intestines numerous tape-worms were found and another leech-like parasite. There was in all probability about 10 lbs. weight of tape-worms in the gut. Its weight by the dynamometer was half a ton. Several others were seen twice as large. Brown saw a globe-fish with a small fish attendant on it. *Salpa* were seen frequently floating past." From "Zoological Log of S.Y. *Scotia*", on January 1, 1903, in lat. 39° 01′ S.; long. 53° 40′ W.

The lethargy of the sun-fish has often been referred to. The individual mentioned above, now exhibited in the Royal Scottish Museum, Edinburgh, was regarded by its captors as a tiny specimen compared with others seen the same day "about the size of a small haystack", and of it they said, "Its stupidity was amazing; unable to swim faster than a boat could row, all it had to do to escape was to sink—and this they can do quite well,—but although struck by a harpoon a dozen times before one held, it made no attempt to escape. . . . When cut up it was easily seen why the first harpoons would not hold, as under the skin was a layer two or three inches thick of a hard cartilaginous material. The dissection was performed mainly with axes. The central nervous system was very interesting on account of its minute size relative to the body, the spinal cord being only about half an inch long and barely coming outside the cranial cavity. This degeneracy is doubtless correlated with the feeble musculature and swimming powers. Intelligence and mobility have become superfluous, the size and thick hide being sufficient protection against most enemies." From "The Voyage of the *Scotia*", by R. N. Rudmose Brown, R. C. Mossman, and J. H. Harvey Pirie.

Hurricanes of the Southern Hemisphere

January 7.—The greatest frequency of hurricanes or revolving storms in the southern hemisphere occurs about the second week in January, though they may be experienced at any time during the southern summer. Four areas are subject to these storms, the islands of Polynesia, especially the Samoa, Fiji and Tonga groups, the Coral Sea between Queensland and the Fiji Islands, the north-west coast of Australia and the South Indian Ocean between the Chagos Archipelago and Madagascar. The Australian storms are locally known as 'Willy-willies', and in addition to causing loss of shipping, frequently result in disastrous floods. The majority of the hurricanes in the southern hemisphere originate between lat. 5° and 15° S., travel at first towards west-south-west, recurve in about 20° S. and finally pass away to the south-east, decreasing rapidly in intensity.

"Furze or Gorse (*Ulex europæus*) flowering"

This record made by Gilbert White at Selborne on January 8 is a reminder of the winter activity of gorse which makes it an important item in the economy of the countryside. The closely cropped conical bushes, which in many places dot a pasture like old-fashioned bee-hives, are evidence of the part it plays in the winter food-supply of rabbits and sheep. Before roots were commonly available for the winter feeding of farm stock, gorse partly took their place: "The sowing of whins for feeding of cattle takes mightily about London just now [1725] . . . this improvement comes from Wales, where it has been practised these hundred years." In Scotland rough whins from waste ground were used in place of the more tender sown crop, and these had to be broken and pulped before being served to the cattle. The apparatus used was a cumbersome whin-mill, the essential part of which consisted of a huge stone roller dragged by an ox or a horse round a paved circuit, upon which the whins were laid. Remains of such whin-mills are still to be seen at occasional farmhouses in Scotland, although whins have long since dropped out of use. In the south of Ireland, however, on hillside farms where hay is scarce, whins are still used for feeding horses during the winter months. The seed is sown on spare ground, and the crop, cut in the following year, is passed through an ordinary chaff-cutter before being served.

The Hibernation of Frogs

In early January 1932, Francis B. Bent (as recorded in the *Observer*, May 1, 1932) emptied a pond and cleaned it out. The pond was ten to fifteen feet deep and the normal depth of water was four feet, but in the clay ooze at the bottom there were discovered thirty or forty frogs. In the same month H. C. Davies (*Field*, May 8, 1932) ran the water out of a small spring-fed pond in order to dig the mud out. In so doing he dug out, not an isolated frog, but dozens. "Their appearance was not attractive—discoloured and skinny—but all alive, though showing very little energy."

Although the older naturalists believed in the hibernation of frogs in winter in the mud of ponds, doubt has recently been thrown upon the possibility

of survival of air-breathing, lung-possessed creatures in such circumstances. However, in the height of the mating season, when activity is not at its lowest, one has seen beneath the clear water of a pond mated frogs remain for long periods inactive on the bottom, and in face of such experiences as are related above it seems probable that in cold weather the lowering of activity in these cold-blooded animals reduces metabolism to so low a pitch that the oxygen required can be obtained by transpiration through the skin. The problem still to be solved in regard to cold-blooded hibernators, as P. A. Gorer has pointed out, lies in the physiological changes which enable the tissues of an adapted animal such as the common frog (*Rana temporaria*) to recover from cooling which is not excessive, while such recovery is impossible in unadapted animals.

Societies and Academies

LONDON

Royal Meteorological Society, Dec. 14. C. S. DURST: "The thermal balance of a water drop or ice particle suspended in the atmosphere." From the examination of the long wave radiation received and given out by a water drop or ice particle, it is shown that such a particle will lose heat if it is above a certain critical temperature and gain heat if it is below, from which it follows that if a particle exists in the stratosphere it will gain heat. It is assumed that the base of the stratosphere is saturated and consideration is given to the conditions under which particles could be formed. If a small air mass were raised in the stratosphere the particles formed in it would be melted in a very short time and the temperature of the air would once more be that of its surroundings, the entropy of the air having been increased in the process.—E. W. BLISS: The tabulation of world weather (5). (Discussion by Sir Gilbert Walker.) (*Mem. Roy. Meteor. Soc.*, 4, No. 36.) In order to form more definite ideas regarding the oscillations named the North Atlantic, the North Pacific, and the Southern, series of figures have been derived to express the variations of each, and from these have been obtained their relations with pressure, temperature, and rainfall over wide regions as well as the relations of the three oscillations with each other and with sunspots. The southern oscillation in the southern winter is extremely persistent, and its departure has a correlation coefficient of 0·84 with that of the following summer.—C. S. DURST: "The breakdown of steep wind gradients in inversions." On certain occasions when inversions have formed, a violent eddying arises, which is shown on an anemometer as an abrupt change in the type of trace. This change over occurs when the wind gradient becomes great. On the ground that the eddies formed in these circumstances are different in character from those formed with an adiabatic temperature gradient, a suggestion is put forward for the mechanism of the diurnal variation of wind.

DUBLIN

Royal Dublin Society, Nov. 22. J. H. J. POOLE: An investigation of the behaviour of neon discharge tubes in a flashing capacity circuit by means of a cathode ray oscillograph. The effects of leakage currents in the oscillograph were eliminated by using the oscillograph in conjunction with a valve anode resistance amplifier. For small shunting capacities the flashing may be extremely irregular, and quite considerable currents pass through the tube before the flash occurs. The presence of radium lowers the striking potential and, by decreasing the maximum dark current, increases the regularity of flashing. The effect of the shape of the electrodes has also been investigated. For concentric cylindrical electrodes, at the filling pressures used, the difference between the striking and extinction voltages is less when the inner cylinder is negative. H. M. FITZPATRICK: The trees of Ireland, native and introduced. A catalogue of the tree species growing in Ireland giving the dimensions attained by each in different parts of the country with, in the case of exotics, an account of their natural distribution and introduction into cultivation. 150 broad-leaved and 215 coniferous trees are recorded. G. T. PYNE and J. J. RYAN: The colloidal calcium phosphate of milk. Some samples of milk out of a large number tested developed a marked alkalinity to phenolphthalein on addition of oxalate. As the wheys prepared from the same milks did not do so, it appeared that the alkalinity must arise from the interaction of the (potassium) oxalate with the casein calcium phosphate complex of milk, presumably owing to the conversion of insoluble tri-calcium phosphate into the strongly alkaline tri-basic potassium salt. The amounts of tricalcic phosphate required to account for the observed alkalinities approximated to those usually accepted for the entire colloidal phosphate of milk, suggesting that the greater part of this colloid must consist of the tri-basic salt. The bulk of the casein calcium phosphate complex was removed by prolonged high speed centrifuging from two very different types of milk (as regards their reaction with oxalate) and submitted to analysis. The results appeared to show that the bulk of the colloid in each case consisted of tricalcium phosphate, and that the variations in the behaviour of different samples to oxalate was thus connected with the relative quantity of the colloid present rather than with variations in its composition.

PARIS

Academy of Sciences: Nov. 14. CH. MAURAIN and J. DEVAUX: Electrical conductivity and atmospheric condensation nuclei during a voyage to Greenland. There is a general resemblance between the electrical conductivity of the air in the polar regions and that on mountains at high altitude, possibly due to the purity of the atmosphere and the dryness. The measurements were too few to enable any deductions to be drawn as to the effects of the meteorological conditions. MARIN MOLLIARD: Aseptic tuberisation and morphological characters resulting from the action of saccharine food on the onion, *Allium cepa*. E. MATHIAS: Death by the return stroke (lightning). J. CANTACUZÈNE and A. TCHEKIRIAN: The presence of vanadium in certain tunicates. Vanadium has been found in nine species of tunicates: the proportion is higher in young animals than in adults. POTRON: The Riemann spaces admitting a group of isometric transformations with $n(n+1)/2$ parameters. MARCEL BRELOT: The study of the point singularities of subharmonic functions. PIERRE HUMBERT: Bessel-integral functions. D. POMPEIU: A theorem, analogous with that of Rouché, relative to the zeros of holomorph functions. NICOLAS APRAXINE: A calculating machine worked electrically. B. GALERKIN: