

requirement far beyond the conceptions of those who, sixty years ago, were willing to estimate in what parts of the country the term 'muggy' might apply, on the assumption that the oncoming depression would resemble Abercromby's classical model.

The annual report of the Meteorological Office for the year ended March 31, 1957*, shows admirably, with a subdued but unmistakable note of confidence, that the public service continues to make that sober progress which is to be desired on the part of those who study turbulent motion. As Sir Graham Sutton says, the meteorological problem is probably the most difficult in classical physics, and progress can only be made with the utmost diligence. Forecasting naturally attracts most attention, and efficient accomplishment in dealing with stupendous quantities of incoming factual material will be greatly aided as newly installed electronic computers come more into use. The development and direction of an active cadre of young research workers will ensure that in an accelerating world we shall not only keep up with our neighbours, but may here and there set the pace.

* Annual Report on the Meteorological Office for the year April 1, 1956, to March 31, 1957. Pp. 51+4 plates. (M.O. 633.) (London: H.M. Stationery Office, 1957.) 3s. net.

Readers of the report cannot fail to be impressed by the variety of services provided and by the diversity of research; for example, "experiments with the release of silver iodide from ground generators on Salisbury Plain continue with no result yet detectable". Elsewhere is mentioned the work on forecasting the outlook for periods up to a month ahead; "the outlook on this stubborn problem is rather brighter than hitherto".

The British business man is too often insufficiently aware of these public services; and the potential rewards of successful forecasting offer abundant temptation to incautious consultants. There are those who, to all appearance, gamble on sunspots; those who believe it has been given to them to discover periodicities of various sorts; those who think in terms of singularities, and perhaps some on the outskirts who appear to be best described as 'hunch-drunk', to use the delightful phrase coined by an eminent professional meteorologist. But how many of our would-be 'independent consultants' have the temerity to disregard the world synoptic charts, so efficiently assembled by the Meteorological Office working with other nations in an unostentatious but exhilarating daily display of international collaboration?

GORDON MANLEY

RÉAUMUR

BESIDES his thermometer, René-Antoine Ferchault, lord of the manor of Réaumur in the Vendée, and of Des Angles and La Bermondière, made many contributions to scientific knowledge. In 1708, at the age of twenty-five, he presented a memoir to the Academy of Sciences, and in 1709 two others concerned with general solutions of certain geometrical problems. Having justified his election as *élève* in geometry, he then turned his attention to natural history, and in some highly original observations demonstrated that the shells of molluscs grow by successive external additions of new parts rather than by the alternative process of intussusception. On the death of the geometer Louis Carré in 1711, he was promoted to *persionnaire mécanicien* and put in charge of the work on trades, arts and crafts; he compiled volumes on the manufacture of anchors, of pins and of cast iron.

In the next few years Réaumur discovered an insect living as an internal parasite on the snail; he studied the movements of shell-fish, sea-anemones and starfish, and the great variety of organs of locomotion in shell-fish and their means of attachment to different solid bodies; he found a hitherto unknown fish that gave a purple colouring matter like the famous Tyrian purple of the ancient world; he demonstrated the correctness of the popular belief that crayfish, crabs and lobsters, having lost a claw, could grow another in its place; he studied the torpedo fish, or electric ray, known for its property of numbing the hand or limb that touched it, and, while the usual explanation was that this was due to the emission of 'torporific corpuscles', he argued that it was produced by the speed and rapidity of the blow that the ray could inflict by means of its admirably constructed muscular system; he examined the native turquoises of Languedoc, showed that they were in no way inferior to those imported from Persia, supposed at that time to be the only source

of these gems, and demonstrated by experiments that they were petrified fossil-bones coloured by a metallic ingredient dissolved in them by firing; he studied pearls and their production and falsification, considering the former as due to disease and showing that the colouring matter of false pearls was obtained from the scales of a fish known as the ablette (in English, the bleak); he examined the great bank of *falun*, or fossil shell-marl, in Touraine; he was interested in the nature and formation of flint, in the plant called *Nostoc* or star-jelly, in the luminescence of certain shell-fish, in the ease of magnetization of iron and steel by percussion, and in the recovery of gold from the sands of various French rivers; he had also already begun to reveal his active interest in the practical arts and their relation to the sciences, reporting to the Academy descriptions of the preparation of slate, and of the gilding of leather, of mining for iron-ore, of the manufacture of mirrors, of the drawing of gold-wire and the properties of paper and other bodies in preventing the passage of air and water.

Later, Réaumur published a paper describing the procedure for the conversion of wrought iron into steel: this is a landmark in the history of the iron and steel industry and effectively marked the introduction of the manufacture of steel into France.

Réaumur also rendered a similar service to the tinplate industry; he showed that vinegar was the cheapest and most effective solvent for the removal of the scale from the surface of the iron before tinning.

All this, as well as Réaumur's outstanding achievements with thermometers and in entomology, is described in a fascinating article by Prof. D. McKie published in *Science Progress* (45, No. 180; 1957). Besides this study of Réaumur, the journal contains an article by Prof. W. B. R. King on water supply and geology and one by Dr. G. H. A. Cole on the Earth and its magnetic field.