

this it is necessary to reduce the local observed value to sea-level. This involves an estimation of the masses of the earth above sea-level, both above and below station-level, in order that their effect may be correctly allowed for.

Mr. Oldham first takes the case of an imaginary mountain range agreeing approximately in its dimensions with the Himalayas, but more regular in form, consisting of a plateau of 15,000 ft. altitude, from which an incline of 100 miles in breadth descends to 5000 ft. by a series of steps, and terminates in another plateau at an altitude of 1500 ft., and 20 miles broad, bounding the Gangetic trough on the north.

Utilising this imaginary range, the effects of various hypotheses of compensation are considered, and the deflections at a series of points on a line crossing the range are computed and tabulated. The attractions of the visible masses, both compensated and uncompensated, are compared, and also the topography of the imaginary range and the actual topography, as determined by Major Crosthwaite, R.E. The Siwalik Hills, with their lower density of about 2.2, as compared with the 2.7 of the Himalayas, are separately taken into account. The case of uniform compensation to different depths is examined and compared with the results given on the assumption of a variable compensation.

Passing from the hill range to the Gangetic trough, reasons are given for taking the value 2.16 for the density of its filling material, and on this assumption the deflections due to such a trough of various depths, breadths, and sectional forms are computed and compared. All this forms a standard of comparison for estimating the value of the observational material, and the geodetic data along lines traversing the Gangetic trough are next examined, the conclusion being reached that the maximum depth of the trough need not exceed 25,000 ft., and can scarcely be less than 20,000 ft., according to the deflection observations. The gravity observations are next discussed and are considered to bear out generally the conclusions which had been reached on the deflection data and to indicate a general upward slope of the floor of the Gangetic trough towards the south. Special cases at Dehra Dun, in the Punjab, etc., are discussed in fuller detail, and near the Siwalik Hills a maximum depth of at least 10,000 ft. for the trough is highly probable.

The next stage in the investigation is a discussion of the support of the Himalayas, and taking the Himalayan geodetic stations, the probable and actual deflections are compared. Local topographical irregularities introduce difficulties in some cases, but there is in all three regions examined an excess of observed over calculated deflection in a northerly direction. Neither alteration in the depth to which compensation extends nor the adoption of a hypothesis of flotation provides an explanation, but the author would attribute it to departures from locally complete compensation. The observations of M. de Filippi's expedition to the Himalayan region should add

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valuable material for this inquiry, but at present there seems to be a defect of gravity as the hills are entered.

This memoir is a valuable addition to geophysical literature, and a useful contribution to the study of a difficult problem which will be welcomed both by geologists and geodesists. It is to be regretted that the illustrations are poor specimens of such work, for there should be no difficulty in providing more satisfactory blocks. The omission of an indication of the units employed in several of the tables is tiresome to the reader.

H. G. L.

CLIMATOLOGY AND AN ABANDONED FLYING SCHOOL.

THE *Times* of May 20 contains a summary of the third report of the Select Committee on National Expenditure, which gives the material facts about the abortive scheme of the War Office to establish at Loch Doon, Ayrshire, a large school for the training of airmen in gunnery. It is a striking and very expensive example of that incoherence or lack of co-ordination under stress against which the discipline of science as a part of education should be our safeguard. In 1916 the Air Board wanted an aerodrome for special purposes, and found a site at Loch Doon which would fulfil their requirements provided that a peat-bog on the western side of the lake could be drained and certain engineering work carried out on the eastern side. Taken independently, both these conditions could be satisfied, and operations were set on foot. By May, 1917, the estimated cost was 350,000l.; afterwards, large further sums were being asked for to complete the scheme; but, though each item had been separately satisfied, the object was not achieved. The climatic conditions were quite unsuitable for a training school, the local "bumps" were a great drawback for the special purpose of the aerodrome, the conditions of the surrounding area placed intolerable restrictions upon its use, and, on account of the increased speed of flight, the engineering works were already out of date. In January, 1918, the Air Council decided to cut the loss and abandon the scheme.

Looking back at the evolution of this fiasco, various points are evident. The air authorities apparently worked by the map, the engineers considered only the questions of draining a bog and constructing certain railways, hangars, etc., not the making of an aerodrome; and the vexatious details of the climate of the British Isles were left to express themselves in their own inexorable way when the mechanical operations had been provided for. The last is, perhaps, the most instructive feature of the situation. Climatology is the science which uses the common experience of past weather to safeguard the future of all operations that depend upon weather. Its basis of fact is merely organised public memory. The Meteorological Committee, in its reports, has frequently urged that, in the public interest, local authorities

should keep suitable records. If this course had been followed in Ayrshire, some 500,000*l.* might have been saved. But our local authorities have not yet acknowledged the duty.

It has been left to the meteorological societies, or the Meteorological Office, or the British Rain-fall Organisation to collect such observations of weather as are made for country landowners or by meteorological enthusiasts in various localities; the distribution is naturally haphazard. Moreover, with the possible exception of the water engineer, the people who have to carry out such schemes have no training in the use of the collected information or in how to find it, and without some experience the tables are difficult to use. Much of the information requires re-working in order to answer special questions. For those who know where to look for it, there is a vast mine of information about the climatology of the British Isles; but, for lack of schools devoted to such sciences, it is largely unworked. An authoritative compilation is much needed. The Royal Meteorological Society, in co-operation with the Meteorological Office, began to work the data for a climatological atlas shortly before the war, but has had to discontinue the task for the present. It was thought at the time to be an undertaking of great utility, but that its present worth might run to six figures in a single case was clearly not realised.

NOTES.

THE twelfth annual meeting of the British Science Guild will be held at the Mansion House on Wednesday, June 19, at 4 p.m., the Lord Mayor in the chair. Lord Sydenham, president of the guild, will deliver an address on "Education, Science, and Leadership"; and other speakers will be Sir Algernon Firth, Bart., and Sir Henry Newbolt. Tickets of admission may be obtained from the Secretary, British Science Guild, 199 Piccadilly, London, W.1.

THE Lords Commissioners of H.M. Treasury have approved the proposal of the Meteorological Committee that, in view of the variety and importance of the scientific problems upon which the Meteorological Office is required to advise the fighting forces, Sir Napier Shaw shall, for the period of the war, become scientific adviser to His Majesty's Government in meteorology, and be relieved of the administrative duties of the Meteorological Office, but retain the chairmanship of the Meteorological Committee. Lt.-Col. H. G. Lyons, with the sanction of the War Office, has been appointed acting director of the Meteorological Office for the same period. We most heartily congratulate the Government and Sir Napier Shaw upon this appointment. Meteorology in England has made great progress during the last twenty years, and a large share of the credit for this must be given to Sir Napier's administration of the Meteorological Office and to his lectures and papers on the subject. The value in war of correct forecasts is obvious, but there are many other ways in which an intimate knowledge of meteorology may be of use, and no more suitable man could have been found for the new post.

THE return to Copenhagen from Greenland, *via* the Farøe Islands, of Mr. Knud Rasmussen, the Danish Arctic explorer, is announced by Reuter's Agency. In

1916 Mr. Rasmussen explored the coasts of Melville Bay between Upernivik and Cape York, as ice prevented his reaching his station at Thule, in North Star Bay. In 1917 he returned to his original programme of exploring the north-west coast of Greenland, with special reference to Eskimo migrations. This was almost the last unexplored part of the Greenland coast. The expedition also planned to carry mails to the American Crocker Land Expedition and its relief expedition, the latter supposed then to be at North Star Bay, south of Smith Sound. The news now to hand through a Reuter message reports that Mr. Rasmussen reached Sherard Osborne Fjord early in May, 1917, and spent the summer in mapping the little-known fjords as far north as De Long Fjord. The difficulties of travelling were accentuated by the absence of game. In the beginning of August the expedition started south again over the ice, and with great difficulty reached Cape Agassiz, 140 miles north of Etah, in three weeks' time, and Etah on September 10. Dr. Wulff, one of the men of science, died of exposure. Mr. Rasmussen apparently wintered at Etah or Thule, and left Greenland this spring. He reports no trace of Eskimo migrations on the north-west coast. Apparently his plans for traversing the Canadian Arctic archipelago from east to west have been deferred.

SCIENCE has lost another distinguished young votary by the death of Capt. James Watson Pryde, who fell in action in East Africa on May 5. Capt. Pryde was a native of Dundee, and received his early education at the Morgan Academy. He then entered the University of St. Andrews, and completed his arts course with distinction in every class. With a strong bent for science, he selected zoology as his main department, and there he gained the highest honours in class and degree examinations, as well as in practical work. Moreover, he at once commenced, as Walker Trust scholar, original work at the Gatty Marine Laboratory, taking up the study of the North Sea Polychæts where another able graduate, Wm. Small, now with the fighting forces in East Africa, had left off, and his published papers show that he did so with conspicuous success. Early in his college career Pryde joined the O.T.C., and at the outbreak of the war was sergeant-major. He volunteered for service at once, and received a commission in the Black Watch, his talents, administrative skill, and agreeable bearing making him very popular. He was then attached to the King's African Rifles, and lately was at Zomba, Nyasaland, pursuing the Germans into Portuguese East Africa, in the region of the Lugenda River. He was looking forward to an early return to continue his researches and the study of medicine. The loss of a zoologist so able and accomplished, and of so gallant a soldier, is grievous.

THE Trustees of the British Museum have published a report on an investigation carried out by Mr. J. Hartley Durrant, of the Natural History Museum, and Col. W. W. O. Beveridge to ascertain how and when the infestation of Army biscuits by flour-moths takes place, and whether any steps can be taken to prevent this. A list is given of eight species of beetles and four Pyralid moths that were actually found in the tins of biscuits examined. But by far the most serious pest was the moth *Ephestia kühniella*, and excellent illustrations and a full description are given both of this species and of *Corcyra cephalonica*. Evidence is adduced indicating that Central America is probably the original home of *E. kühniella*, the so-called Mediterranean flour-moth. The examination of various intact airtight tins showed that the biscuits