

continuity of strata can be made out from the bird's-eye view of country in which the ground worker is baffled at close quarters by the confusion of detail resulting from erosion, accumulations of detritus, and the presence of false dips due to local and superficial collapse of strata. The observer is warned against reading 'strike' into a banding due to the parallel alignment of superficial sand dune accumulations; furthermore, where dips are slight, it is often impossible to determine in which of the two possible directions they lie, and for this ground-leveling is required.

It was in bare featureless plains devoid of rock exposures that the most remarkable results were obtained. Sometimes it was possible to detect geological structures of great importance where the absence of outcrops presents an insurmountable obstacle to ground survey. Here a pattern can be discerned which the geologist can recognise at once as that of a geological map, and in one case the proved structure of an area with abundant outcrops was followed into adjacent lowlands the geological structure of which has hitherto remained hidden. Such pattern is due to the different appearances of soils to the 'actinic eye' of the camera. Clearly these soils have developed from the weathering of the rocks beneath them, the disposition of which they thus reveal. Pattern may be seen through thin parched grass but it is lost with a fresh luxuriant growth, and the survey must be made when the conditions are favourable.

Some success was achieved in gleaming information regarding the geology of heavily forested regions, and much may be expected from the further development of this line of attack on a type of country which is the despair of the investigator on the ground.

L. H.

University and Educational Intelligence

LONDON.—The following appointments to University readerships have recently been made: botany (Birkbeck College), Dr. F. C. Steward, since 1929 assistant lecturer in botany in the University of Leeds; epidemiology and vital statistics (London School of Hygiene and Tropical Medicine), Dr. A. B. Hill, who since 1923 has been carrying out investigations and research at the School.

The title of emeritus professor of eugenics in the University has been conferred on Prof. Karl Pearson, on his retirement from the Galton chair of eugenics at University College, and that of emeritus professor of Egyptology in the University on Sir Flinders Petrie, on his retirement from the Edwards chair of Egyptology at University College.

The following degrees have been awarded: D.Sc. to B. F. Barnes (Birkbeck College) for ten published works on botany; D.Sc. to J. C. F. Hopkins (King's College) for ten published works on plant pathology.

MR. THURKILL COOKE, a member of the General Committee of the British Association, has offered to present to the universities of England a collection of works on nautical science. The first presentation under the offer has been made to the University of London. Librarians of English universities desirous of receiving such accessions should communicate with the Assistant Librarian, British Library of Political Science, Houghton Street, W.C.2.

Science News a Century Ago

Royal Society, January 9

The portrait of the late president, Davies Gilbert, painted by Thomas Phillips, R.A., at the solicitation of several members, was, by their request, presented to the Society. A paper was read on 'The Empirical Laws of the Tides in the Port of London'. By the Rev. William Whewell, F.R.S., Trinity College, Cambridge. The author regards existing tide tables as extremely imperfect; the mathematical solutions of the problem founded on hypotheses remote from the real facts. The Earl of Tyrconnel was elected into the Society.

The Royal Medals of the Royal Society

The January issue of the *Gentleman's Magazine* in 1834 contained an excellent notice of the anniversary meeting of the Royal Society. The Duke of Sussex made a statement relative to the Royal medals placed at the disposal of the Society by His late Majesty in 1828. Mr. Chantrey, in conjunction with Sir Thomas Lawrence, was appointed to prepare a design. Either from indecision, or that procrastination for which the late president of the Royal Academy was characterised, the design was never furnished, although it was a frequent and favourite theme of conversation. After an inquiry, steps were taken, however, to redeem all the pledges made by George IV to the Royal Society. The *Gentleman's Magazine* records the awards of ten medals to the following, and the reasons: Dr. Dalton, to whom was owing the development of the atomic theory; although at the eleventh hour, it was gratifying to know that he was acknowledged as its author both at home and abroad; to Mr. Ivory, the first English philosopher who introduced to Great Britain the beautiful and refined discoveries of Laplace, Lagrange and other foreign astronomers; to Sir Humphry Davy and Dr. Wollaston in testimony of services in science; to Prof. Struve, for researches respecting double stars; and to Prof. Encke, the greatest, perhaps, of modern astronomical calculators, and the discoverer of the comet which bears his name. The Duke of Sussex alluded to Sir John Herschel as one who had terminated his European labours; and a rich harvest was to be expected as the result of his labours in the ample field of a new and unexplored heaven.

The *Mechanics' Magazine*

The issue of the *Mechanics' Magazine* for January 4, 1834 opens with a reprint of a paper by Dr. Robert Hare, then professor of chemistry in the University of Philadelphia, on a galvanic rock-blasting apparatus, in which the use of electricity is advocated for mining. This is followed by a reprint of a paper by Mr. Sang, of Edinburgh, on the relation of a machine to its model. Next there is correspondence on canal improvements, and on the performances of the steam carriages of Hancock and Maceroni, followed by a note on isometric projection and a letter from John Ericsson on his caloric engine. Of considerable interest are the notices of the activities of two societies. The Marylebone Literary and Philosophical Society, it was stated, was in a very flourishing condition and had bought 17 Edwards Street, Portman Square, where it was proposed to erect a lecture

room to hold six hundred persons. Sir Anthony Carlisle, Dr. Lardner and John Phillips, the geologist, were all vice-presidents of the Society, before which many eminent men lectured. Another society flourishing then was the Brighton Literary and Scientific Society, the president of which was Mr. Ricardo. The president, so the *Mechanics' Magazine* states, had just concluded a series of lectures on railways. In the course of these lectures he had read a communication from George Stephenson in which it was said that a speed of forty miles per hour had been attained on the Liverpool and Manchester Railway and that "an engine might be constructed to run 100 miles within the hour although at that rapidity of motion the resistance of the atmosphere would be very considerable indeed".

Literary and Scientific Institutions

A correspondent contributes the following statement to the *Gentleman's Magazine* of January 1834:—The number of Literary and Scientific Societies has been greatly on the increase. The Royal Society numbers 750 members; the Antiquarian, 300; Royal Society of Literature, 271; Zoological, 2,446; Horticultural, 1,875; Royal Society of Arts, 1,000; Royal Institution, 758; Geological, 700; Linnæan, 600; Asiatic, 560; Geographical, 520; Astronomical, 320. The members constituting the London Medical, Westminster Medical, Medico-Chirurgical, Medico-Botanical, Phrenological and Entomological Societies, the College of Physicians and Surgeons, and Institution of Civil Engineers, cannot be short of 1,700 persons. Next follow the London, Russel, Western and Marylebone Institutions, whose proprietary and yearly subscribers may be estimated at 1,500. Here are in the whole 13,000 names (some it is true frequently repeated) supporting 26 Associations in London, founded for the sole purpose of promoting the interests of learning and science and diffusing useful knowledge. And, for the immediate benefit of the operative class, the Metropolis possesses a *Mechanics' Institute* which is said to have 1,000 members.

Investigations of Terrestrial Magnetism

About 1834 great activity prevailed in the investigation of the earth's magnetism, and magnetic observations were being made not only on land but also on exploring ships. On December 19, 1833, Commander J. C. Ross described before the Royal Society his expedition to the north magnetic pole, which he reached on June 1, 1831, and his measurement of the dip as $89^{\circ} 59'$. This determination was made with great care, and was as accurate as was then possible. Improvements of the magnetic instruments and the elimination of errors were being actively sought. On January 6, 1834, Mr. W. Snow Harris read before the Royal Society of Edinburgh a paper "On the Investigation of Magnetic Intensity by the Oscillations of the Horizontal Needle", in which he closely examined many real and supposed disturbing factors. He showed that light had no effect on the oscillations, but that they were susceptible to disturbance by slight air currents, and the instruments must therefore be enclosed, preferably in a vacuum. He also investigated methods of suspending magnets, the effects of changes of temperature and the determination of changes in the constants of magnets.

Darwin in Patagonia

For the greater part of 1832 and 1833, H.M.S. *Beagle*, under Capt. FitzRoy, had been on the east coast of South America, and Darwin had been able to make several expeditions inland from ports such as Buenos Aires and Monte Video. Leaving the Rio de la Plata on December 6, 1833, the vessel visited Port Desire on December 23 and then sailed for Port St. Julian farther south.

Here, on January 9, 1834, Darwin records: "Before it was dark the *Beagle* anchored in the fine spacious harbour of Port St. Julian, situated about one hundred and ten miles to the south of Port Desire. We remained here eight days. The country is nearly similar to that of Port Desire, but perhaps rather more sterile. One day a party accompanied Captain FitzRoy on a long walk round the head of the harbour. We were eleven hours without tasting any water and some of the party were quite exhausted. From the summit of a hill (since well named Thirsty Hill) a fine lake was spied, and two of the party proceeded with concerted signals to show whether it was fresh water. What was our disappointment to find a snow-white expanse of salt, crystallised in great cubes! . . . Although we could nowhere find, during our whole visit, a single drop of fresh water, yet some must exist; for by an odd chance I found on the surface of the salt water, near the head of the bay, a *Colymbetes* not quite dead, which must have lived in some not far distant pool. . . . A good sized fly (*Tabanus*) was extremely numerous, and tormented us with its painful bite. The common horsefly, which is so troublesome in the shady lanes of England, belongs to this same genus. We here have the puzzle that so frequently occurs in the case of mosquitoes—on the blood of what animals do these insects commonly feed? The guanaco is nearly the only warm-blooded quadruped, and it is found in quite inconsiderable numbers compared with the multitude of flies." ("Journal of Researches.")

Societies and Academies

LONDON

Physical Society, October 20. A. F. DUTTON: Graphic statistics. The plotting of frequency-distributions is discussed. In comparing for different populations the frequency-distributions of a particular variate, it is sometimes convenient to take one population as standard and to represent its distribution by a straight line. The method of plotting individual points described by Hazen is incorrect.

December 1. H. DENNIS TAYLOR: The image-distortion and other effects due to the glass-thickness in lens systems. The optical influence upon distortion of image, or departures from correct pictorial representation, caused by the considerable thicknesses of glass involved in the construction of high-class photographic lenses of projectors having a large angular field of view is discussed. H. CARMICHAEL: The tilted electrometer. A detailed description is given of the construction and performance of a new evacuated critically damped quick-reading quartz-fibre electrometer. The sensitivity obtainable is limited only by the Brownian motion of the fibre. The minimum potential change