discussed under six separate elements. The climatological conditions are dominated by the N.E. monsoon (December–March) and the S.W. monsoon (June–September). The author points out that the temperature is very regular, there being only a difference of a few degrees between the means of the hottest and coldest months. The absolute maximum and minimum quoted during 1910–12 at six selected stations are 98·6° (in April) and 59° (in August), both recorded at Brava. The rainfall reaches its maximum values in April and November; the first rainy period is followed by falls of decreasing intensity and frequency in the coastal districts, and the second period by very scanty falls in the interior and extreme dryness on the coast. The largest yearly mean quoted is 30·1 in. (on fifty-two days) at Balad, and the smallest, 10·6 in. (on thirty-three days) at Giumbo. Generally speaking, rain falls in eight months on the coast and ten months in the inland districts.

The Bulletin of the Italian Royal Geographical Society for August contains a useful contribution to the climatology of Ethiopia by Dr. Eredia and Dr. De Castro. The results are chiefly based on observations made partly at Addis-Abeba and partly at Addis-Alem, from November, 1901, to June, 1911, excepting between July, 1904, and April, 1905, with instruments supplied by the Italian Meteorological Office. Monthly results for each year are given for temperature and rainfall, and in a less complete way for humidity and wind-direction. The mean annual temperature is 62·1°; highest mean monthly maximum, 80·1 (May); lowest mean minimum, 42·8° (December); absolute maximum, 100·4° (September); absolute minimum, 32·0° (December). The annual rainfall is 47·7 in., on 148 days. The authors' division and description of the seasons give a good general idea of the climate: winter (October–December), low temperature and scarcity of rain; spring (January and February), moderate temperature and relatively small rainfall; summer (March–June), high temperature and relatively large rainfall; autumn (July–September), moderate temperature and abundance of rain. The division of the year into seasons by the natives is essentially based on the occurrence of rainfall periods.

An article by Prof. Karl Dove, on the climate of German South-west Africa, was contributed to *Himmel und Erde* of December, 19, 1913. The protectorate extends from 17° to 29° S. latitude, but its position on the west side of the continent greatly modifies its climatological features, as compared with those on the eastern shore. Near the coast the cold water of the Benguella drift-current reduces the temperature considerably; but the inland parts owe their relatively low temperature to their great elevation above the sea. The annual range is very regular, and the approach of summer or winter has little interest for the inhabitants compared with the date, duration, and amount of rainfall. The heavier falls mostly occur between January and March; irrespective of small variations, Prof. Dove states that, with the exception of the extreme south, six- to seven-tenths of the year's rainfall may be referred to those three months. In large tracts of the western zone the annual fall does not exceed eight inches, and in some years little or no rain falls, not only in the coastal districts, but also in the interior of the country.

A very interesting and useful work on the climate, typhoons, and earthquakes of Formosa, with tables and diagrams, has recently been issued by the Government-General of that island. The meteorological service was organised in 1906 under an Imperial Japanese ordinance; observations are made at ordinary stations, lighthouses and rainfall stations, and the work is carried on almost entirely at Government expense. The central observatory at Taihoku receives and discusses all observations and also receives a number of telegrams and issues weather forecasts and storm-warnings for the whole island. The climate is subtropical, and may be divided into two seasons; the seven months April to October may be regarded as summer, and the five months November to March as winter. Throughout the island the mean monthly temperature rises to 68° F. in April; from June to September it ranges between 79° and 82°. The highest readings reach about 95°, and in rare cases exceed 98°. In winter the variations between the north and south of the island become more apparent; in February, the coolest month, the mean is about 58° in the north, and 68° in the south. The lowest readings in the north do not usually fall below 41°, and in the south not below 49·6°. In winter the N.E. monsoon brings rain to the northern parts, and in summer the S.W. monsoon and thunderstorms bring abundant rain to the south; the island, therefore, possesses two rainy seasons, each differing in time and place. Formosa lies in the highway of typhoons, and is often visited by those destructive storms; during seventeen years (1897–1913) thirty remarkable storms occurred during the months June to October. Earthquakes are also frequent; all the ordinary observing stations are supplied with seismographs, and shocks are recorded somewhere in the island about every day and a half. The most violent earthquakes are generally in the south-west, and occasionally cause disastrous damage.

ORNITHOLOGICAL NOTES.

THE eighth volume, comprising 533 pages of text, of the *Boletin do Museu Goeldi* (*Museu Paraense*) is devoted to a catalogue of the birds of Amazonia—Catalogo das Aves Amazonicas—by Dr. E. Snethlage. The author, who joined the staff of the museum at Para in 1905, commenced work on this catalogue very soon after his arrival, and devoted to it a large portion of his time during the following half-dozen years. Fortunately, the collection of bird-skins in the museum—some 10,000 in number—is sufficiently comprehensive to have enabled him to accomplish his task on a thoroughly scientific and first-hand basis. The result is a work which forms a worthy companion to Dr. Ridgway's "Birds of North and Middle America," albeit in an absolutely and relatively smaller compass. The author is, indeed, to be congratulated on the conciseness of the generic and specific diagnosis and the clearness of the "keys."

In connection with the above may be noticed the concluding portion of Mr. R. Dabbene's distributional list of Argentine birds, which appears in No. 6 of the first volume of the *Boletin de la Sociedad Physis*, Buenos Aires. The author recognises a total of 324 species. In Dr. Snethlage's catalogue the species are not numbered.

In an editorial article in the August issue of *Wild Life* it is stated that the Paris Committee of Economic Ornithology has been discussing a scheme for breeding white egrets in the marshes of Corsica, and also for rearing these and other birds with valuable plumage in Tunis. In the latter country the idea is that the Government should offer stock-birds on easy terms to the colonists, such birds to remain Government property, but the resulting offspring to belong to the breeders. The same issue contains two beautifully illustrated articles on Spanish heronries, where white egrets, night-herons, and other allied species breed in large colonies.

The July number of *The Emu* contains coloured illustrations of two species of parrots from Northern Queensland, severally representing genera unknown

to occur on the Australian mainland until last year. The first is a local race of Geoffroy's parrot (*Geoffroyus personatus* or *G. geoffroyi*) of Timor, and the second of the red-sided parrot (*Eclectus pectoralis*) of New Guinea. That such common and brilliantly coloured birds should have so long escaped detection in a country like Northern Queensland is very remarkable.

In an article on the ecological relations of bird-distribution, published in the July issue of *British Birds*, Mr. S. E. Brock remarks that while the composition of a country's avifauna is, in one sense, directly related to the present and former configuration of land-masses, the form of its dispersal within the area is immediately attributable to the environmental control. In other words, "the efficient causes of separation between bird-groups in this country are less geographical than ecological; the specific environment is the true 'faunal area.' The group of species attached to a specific habitat compose an association the units of which are primarily inter-related through the connecting link of a common environment."

As the result of a recent comprehensive inquiry, by the issue of circulars, Mr. H. G. Alexander is enabled to give, in the September issue of *British Birds*, a full account of the present status of the land-rail in the British Isles. Throughout the south and east of England, at least from Devonshire to Lincolnshire and inclusive of the south-east Midlands, this once abundant species no longer breeds regularly, although a few pairs nest annually in most counties. In South Wales, the West of England, the Midlands, and so far north as the Pennine Range and the Yorkshire moors, a general decrease in numbers, apparently of more recent date than that in the east and south, is now in progress; but in the Pennines and the districts west of the same no decided diminution is noticeable, landrails being still abundant throughout this area, except on the moors. Everywhere the birds are recorded as mainly frequenting grass or clover, and seldom cereals. Whether this was always the case, or whether they formerly nested in corn, has an important bearing on several of the theories which have been advanced to explain the diminution in the numbers of the species.

In the same issue is recorded the occurrence on May 6, 1914, of a pair of Rüppell's warbler (*Sylvia rueppelli*) at Baldslow, Hastings. This is the first British record of this rare east European species.

To the Transactions of the New Zealand Institute for 1913 (vol. xlvi) Prof. W. B. Benham contributes an article on the nomenclature of New Zealand birds, based on the *Reference List* of Mathews and Iredale.

Another article in the same volume, by Mr. H. Hill, gives the fullest account hitherto published of the history of the early discoveries of moa-remains in New Zealand, together with a discussion as to their geological age, and the probable date of extermination of these giant birds. Contrary to the now generally accepted view that moas were killed off by the Maoris within the last few centuries, the author affirms that these birds lived during the late Pleistocene—the epoch of intense volcanic action in New Zealand—and that they all perished suddenly as the result of such seismic disturbances and the emission of poisonous vapours long previous to the advent of the Maoris, or any other race, in the islands. Basing his views solely on the result of observations on the east coast, Mr. Hill proceeds to observe that none of the numerous moa-remains found in caverns show any evidence of having been touched by men or dogs; and he considers that when the great seismic cataclysm occurred all the birds rushed to the upland caves for refuge—where they were in many cases imprisoned by the fall of pumice in front of the entrance—while others perished in the open, choked by clouds of ashes or by noisome vapours; the remains of these latter being subsequently carried down to the lowlands by floods. No reference, it may be added, is made to the comparatively fresh condition of moa-remains in many districts, or to their alleged association with Maori camping-places and camp-fires.

In an article on birds observed last spring during a yachting cruise amid the Scottish islands, published in the August number of the *Scottish Naturalist*, the Duchess of Bedford directs attention to the vast numbers of fulmars snared at that season by the natives of St. Kilda, who bring them in by boat-loads. Such a practice, remarks her Grace, seems short-sighted on the part of people who depend largely upon these birds for a living; but, nevertheless, the fulmars still maintain their numbers. On the "Stack," which was also visited, the number of gannets has been estimated by one observer at 8000, and by a second at 50,000; a revised estimate is between 5000 and 6000.

R. L.

ENGINEERING AT THE BRITISH ASSOCIATION.

THE proceedings in Section G opened at Melbourne with a paper by Prof. Petavel on aviation research. The author described the results of recent experiments on the air resistance of various shaped bodies at different speeds, and also on the lifting power of planes of various shapes. This was followed by a paper on railways and motive power by Prof. Dalby, who showed a number of curves relating to the development and cost of working of British railways, and discussed briefly the relative advantages of steam and electric traction. Mr. Hedley Thomson followed with a paper on a transmission system suitable for heavy internal-combustion locomotives, in which he maintained that the difficulties of the internal-combustion locomotive were mainly due to the want of a suitable variable-speed control mechanism, and that these difficulties were overcome by the Thomas transmission gear, which he described. Curves were shown illustrating the high efficiency and other advantages to be obtained in this way. The internal-combustion locomotive is of special importance in Australia because of fuel and water difficulties. A paper was then read on the Canberra plan by Mr. W. B. Griffin, who was awarded the premium offered by the Commonwealth for the best town-planning scheme for the new Federal capital. The paper dealt with the principles underlying the design of such a town and their applications to the site at Canberra. The Government exhibited a number of elevations showing what Canberra will look like if and when the present scheme is carried through. The concluding paper on the first day was by Mr. Kirkpatrick, on the development of the Port of London.

On the second day Dr. Rosenhain read a paper on the behaviour of metals under strain, and showed a large number of photomicrographic slides illustrating the crystalline structure of metals under various conditions of strain and temperature. He showed that the various phenomena could be explained on Beilby's hypothesis of the amorphous phase in metals. Prof. Dalby then described an attachment for testing machines by means of which the stress-strain diagram is photographically recorded as the stress is applied. He also showed some photomicrographic slides of the structure of metals. A well-illustrated paper by Mr. Humphrey on the Humphrey pump was next read. The discussion showed that Australian engineers were fully alive to the importance of this pump for irrigation, but several speakers regretted the apparent de-