

urged the need of an Institute of Technical Optics, where students of optics will be trained in optics by men whose work is optics. The need grows year by year. Deputations from the trade have waited on the London County Council, and questions have been asked in Parliament, yet in vain. It has been suggested that two separate schools are needed—one for optical workmen, the other for optical calculators, the latter to be a mere small department in one of the universities or colleges. Such a divorce of practice and theory would be futile. What is wanted is an establishment where the whole atmosphere is one of optical interest, where theory and practice go hand in hand, where the mathematician will himself grind lenses and measure their performance on the test bench, where brain-craft will be married to hand-craft, where precision, whether in computation or workmanship, will be a dominating ambition.

As yet the only attempt made towards this ideal is the optical department of the Northampton Polytechnic in Clerkenwell, where a handful of students are housed in wholly inadequate surroundings. In the future institute the teaching must be thorough and independent, and free from all ulterior domination of examinations. The examination blight, which has cramped education in so many ways, has brought us to this pass, that outside the centre just named there is not a college student in Great Britain who is being trained in *optics for its own sake*. The moral is obvious. The future optical institute must be properly housed and equipped as a self-contained monotechic, concentrating all its energies on the one aim. On no consideration whatever ought it to be under the baneful influence of a university, where its students would be diverted from whole-hearted devotion to progress by the temptation of degree-hunting. Would that this convention might make it clear to those in authority that the optical industry is in deadly earnest in demanding the establishment of such a centre of optical training.

BIRD NOTES.

IN the May number of *The Zoologist* Mr. J. M. Dewar discusses the evolutions performed by flocks of certain kinds of wading birds of the family Charadriidae. These evolutions, which are based on a simple type common to the whole family, but frequently comprise specialised additions, are believed by the author to be of a defensive and protective nature, the essential form of movement being an imitation of the sea-spray. "When the flock is large the movements are often sectional, and what seems to be a succession of waves passing through an extended flock is in many cases an extremely quick repetition of the simpler form of the evolutions by sections. The 'sheet-movements' which provide much of the spectacular display are rendered possible by the same circumstance, and generally grow out of the simpler form. . . . In other words, one may say the simpler evolutions are imitative in character and protective in purpose; in the complex evolutions the simpler imitative movements are partially hidden by the development of a wealth of movement which is still protective in purpose, but which, as regards character, is incapable at present of a simple and comprehensive explanation."

Despite the fact that the work of the two sexes can be easily distinguished, it appears from a note in the May number of *Witherby's British Birds* that there is a dearth of trustworthy observations in England to show whether male or female woodpeckers excavate the nesting-hole, or whether both

combine in the task. Continental observers are, however, generally agreed that the cock is the worker, and if this be so the same thing doubtless obtains in Britain, despite certain statements as to both sexes of the green woodpecker having been seen at work together.

In completing his notes on the bush-birds of New Zealand in the April issue of *The Emu*, Mr. J. C. M'Lean observes that, inclusive of the bush-hawk and the morepork, twenty-one species of North Island birds may be classed as arboreal, and of these sixteen have been identified in the Maunga-Haumia bush. Possibly two others should be added to the list; but it is probable that the huia—now very scarce everywhere—never extended so far north. The stitch-bird seems to have been exterminated in the district, if not also on the mainland.

R. L.

COMPARATIVE STUDIES IN MELANESIA.¹

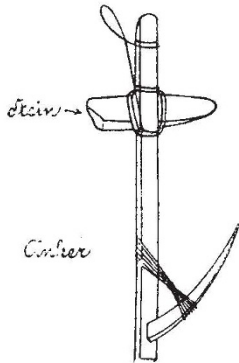
IN the interests of his topographical work the author of the memoir under consideration was obliged to be almost constantly on the move; though this rendered any intensive study of a special people impossible, yet it afforded him opportunities for personal comparison of various peoples and cultures over a wide area. He has worked up the older sources with great care, and in many instances extends his comparisons to America, as he is anxious to see a full treatment of Malayo-Polynesian affinities with South American cultures worked out; the cursory treatment of this vast theme in Graebner's "Bogenkultur" he regards as quite inadequate and faulty in method.

The ethnological section of the memoir (pp. 28-167) deals primarily with western New Britain, of which our knowledge has been hitherto slight, also with the other German possessions in Melanesia, and comparative data from Indonesia and America are added. The physical anthropology is very incomplete, partly through the author's misfortune in losing his apparatus when his boat overturned; head-indices should have been worked out in addition to giving lists of head-lengths and -breadths. As regards material culture, Dr. Friederici has been careful to ascertain the distribution of different objects and customs wherever possible, and he gives a useful account of the various forms of houses observed, and the association of divergent types, with a number of diagrams of dwellings and plans of certain villages. Considerable cultural complexity and wide variation physically are of course to be anticipated in an area situated like the Bismarck Archipelago on the great highway of migration; in fact the author states (p. 316) that a considerable proportion of the natives are directly traceable to the "Alfurus" of eastern Indonesia, whose modified descendants are a relatively recent element in the Bismarck Archipelago and other Melanesian areas.

In the discussion of affinities the author emphasises the importance of linguistic evidence, and the present volume contains a sketch of the grammar of the Barriai language of the northern coast of western New Britain. He makes it a practice to give the native names of cultural objects described, and is a strong advocate of the retention of native place-names, which are already familiar to traders in the locality, and to which after all belongs the priority.

¹ "Wissenschaftliche Ergebnisse einer amtlichen Forschungsreise nach dem Bismarck-Archipel im Jahre 1908." II. "Beiträge zur Völker- und Sprachenkunde von Deutsch-Neuguinea." By Dr. Georg Friederici. Pp. vi+324+iv plates+map. (Mitt. aus den Deutschen Schutzgebieten, Ergänzungsheft Nr. 5.) (Berlin: Ernst Siegfried Mittler & Sohn, 1912.) Price, separately, 3.60 marks.

Lastly, there is an admirable account (eighty pages) of Malayo-Polynesian shipping, especially as occurring in German areas; this is particularly valuable on account of the diagrams (136 in number) of the different parts and appliances, also for the native names of these. It is interesting to note a certain similarity between a form of stone anchor from the west of Ireland and that represented in Fig. 36a, p. 242, here reproduced.



Enough has been said to show that this work contains much information of interest, all of which is obtainable for the modest sum of 3.60 marks. There are a few plates, and a map of New Ireland, Gazelle Peninsula, and New Hannover coloured to show the distribution of languages. We shall look forward to further

investigations by Dr. Friederici, whose wide acquaintance with ethnological literature particularly fits him for comparative work.

A. C. H.

SOLAR RADIATION AT DAVOS.

IN *Naturwissenschaftliche Wochenschrift* (No. 4, 1912), Dr. F. M. Exner gives an elaborate analysis of the principal results of Dr. C. Dorno's painstaking measurements of solar radiation and atmospheric electricity at Davos in 1908-10, made with the most up-to-date instruments, and published, with numerous tables and plates, in a stately quarto volume, entitled "Studie über Licht und Luft im Hochgebirge" (F. Vieweg and Son, Brunswick). We can only quote here two or three of the actinometric results, which serve to show the nature of the work. Although Dr. Exner's analysis is so full, the work contains so much material that it is impossible even to make mention of all the results. The following are the results of 662 determinations:—

Dependence of the Intensity of Radiation on the Sun's Altitude in the Mean of the Year, expressed in Gram Calories (per sq. cm. per min.).

10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°
1'047	1'131	1'172	1'226	1'274	1'302	1'329	1'342	1'355	1'359	1'369	1'364

The daily range of intensity is given for each season and for the year. For the latter we find:—

6h. a.	7h. a.	8h. a.	9h. a.	10h. a.	11h. a.	Noon	1h. p.
1'106	1'141	1'217	1'315	1'324	1'372	1'384	1'360
2h. p.	3h. p.	4h. p.	5h. p.	6h. p.			
1'311	1'228	1'206	1'094	1'018 (June-August)			

With the aid of a Campbell-Stokes sunshine recorder the following effective monthly values of radiation in kilogram calories on a horizontal surface were calculated:—

Monthly Values and Percentage of Possible Values.

Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Year
1'9	2'3	3'3	6'0	7.2	9.6	10.7	10'8	11'0	7'8	5'1	2'8	78'3
53'5	55'7	51'0	56'2	40'5	49'9	51'7	56'0	63'6	60'9	60'0	59'4	55'0

Davos owes its high radiation to its height above sea-level (1560 m.), the southerly aspect of the valley, and its small amount of cloud in the winter months. The highest value of solar radiation measured was 1'522 gram calories (March 5).

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UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

BIRMINGHAM.—On March 26 last the City Council passed a resolution, "That, having received a grant from the city rates, the University of Birmingham be asked to consider the advisability of granting degrees to external students, particularly those trained in the municipal technical schools or the Birmingham and Midland Institute, and report thereon to the council." In reply to this request the council and Senate of the University have just issued a statement setting forth the result of their deliberations on the subject. They point out that "the University was intended by its founders to be limited in granting degrees to students attending the University or affiliated institutions. Courses of instruction under recognised teachers, and daily association with fellow-undergraduates, give a meaning and a value to a degree which would be entirely lost if the degree were granted to external students." The council also points out that the external side of London University already meets the needs of the external student, and that it is quite unnecessary to set up two universities having this external character in the British Isles.

CAMBRIDGE.—The General Board of Studies has re-appointed Dr. Barclay-Smith as University lecturer in human anatomy.

The Raymond Horton-Smith prize for 1912 has been awarded to Dr. V. J. Woolley, for a thesis for the degree of Doctor of Medicine—subject, "The time-relations of the actions of entero-kinase and of trypsin under various conditions"; *proximè accessit*, Dr. A. E. Barclay, for a thesis for the same degree—subject, "The diagnosis of gastric and œsophageal affections by X-ray methods." The M.D. Degree Committee places on record its appreciation of the high standard attained by most of the theses submitted for the degree of Doctor of Medicine. Many of these theses, either records of clinical investigations on obscure diseases or original laboratory research, ought in the opinion of the committee to be published. The theses submitted by G. G. Butler—subject, "The fragility of the red blood corpuscle; A. J. Clark—subject, "The mode of excretion of hæmoglobin and its derivatives; Dr. F. P. Franklen-Evans—subject, "The sensory nerve endings in joints—are worthy of special distinction.

The Special Board for Biology and Geology has nominated, to use the University table at Naples, G. R. Mines, H. M. Fuchs; and J. Gray, to occupy the University table at the laboratory of the Marine Biological Association at Plymouth.

OXFORD.—It is proposed to hold an election in Michaelmas term next to an ordinary fellowship in Magdalen College, after an examination having special reference to excellence in medical science (physiology and pathology).

Convocation on June 25 confirmed the decree accepting the grant of 900*l.* from the Board of Agriculture and Fisheries in aid of investigations into the economics of agriculture. On the same day it passed a decree accepting the sum of 10,000*l.* for the promotion of the study of agriculture from Mr. Walter Morrison, M.A., of Balliol College. It is proposed to apply 3000*l.* of Mr. Morrison's benefaction towards the extension of the Rural Economy Laboratory, it being understood that the Board of Agriculture and Fisheries is prepared to make a grant of an equal amount towards the same object, and to invest the remaining 7000*l.*, using the income for the maintenance of the laboratory and for other purposes connected with the study of agriculture in the University. This makes