sporogenesis agree in all essentials with those already described for the Ascomycetes (Faull, 'Contributions from the Cryptogamic Laboratory of Harvard University,' LXI., in which there is a complete bibliography). Details and further researches in this group, which heretofore has not been subjected to microtonic methods, will be described in a forthcoming paper.

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UNIVERSITY OF TORONTO,
December 2, 1905.

INBREEDING, CROSS-BREEDING AND STERILITY IN DROSOPHILA.

A SERIES of breeding experiments with the common pomace-fly, *Drosophila ampelophila* Loew., conducted during the past five years principally by my pupils and still in progress, has yielded certain results which it is the purpose of this note to summarize. A fuller account will soon be published elsewhere. Those who have taken part in the work are Thomas Ordway, Austin H. Clark, F. W. Carpenter, S. O. Mast, W. M. Barrows and myself. The part of each will be indicated in the final publication. The more important conclusions reached may be stated thus:

1. Inbreeding probably reduces very slightly the productiveness of *Drosophila,* but the productiveness may be fully maintained under constant inbreeding (brother with sister) if selection is made from the more productive families.

2. In crosses of a race of low productiveness and frequent sterility (race *A*) with a race of high productiveness (*B*) it has been found that a female of race *A* does not have her fecundity increased by mating with a male of race *B,* and conversely, a female of race *B* does not have her fecundity diminished by a mating with a male of race *A*. Hence every male not actually sterile furnishes an abundance of functional spermatozoa.

3. The cross-breds produced by the mating, *B* female $\times$ *A* male, are all of high productiveness.

4. The cross-breds produced by a mating *A* female $\times$ *B* male are usually, but not always of high productiveness.

5. The children of both sorts of cross-breds (see 3 and 4) are some of high productiveness like race *B,* others of low productiveness like race *A*.

6. Low productiveness is inherited after the manner of a Mendelian recessive character in certain of the crosses made, skipping a generation and then reappearing. In other cases it has failed to reappear in generation F_2, indicating its complete extinction by the cross. In a few cases it has failed to be dominated by high productiveness in generation F_1. In such cases the female parent has always been of race *A*. Hence low productiveness (or sterility) of the female may be transmitted directly through the egg from mother to daughter, but only indirectly through the sperm, the character skipping a generation.

7. A cross between two races, one inbred for thirty or more generations and of low productiveness, the other inbred for less than ten generations and of high productiveness, produced offspring like the latter in productiveness, but not superior to it.

8. The same two races crossed after an additional year of inbreeding (about twenty generations) produced offspring superior to either pure race in productiveness.

9. Inbreeding does not affect the variability in number of teeth on the sexual-comb of the male.

10. This character is closely correlated with size.

W. E. CASTLE.

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January 11, 1906.

CURRENT NOTES ON METEOROLOGY.

AUSTRALIAN DAILY WEATHER MAPS.

IN 1904 the Public Schools Associations in New South Wales appealed to the Sydney *Daily Telegraph* to publish daily a weather map for Australia in order that the pupils in the schools might be given instruction in meteorology by means of the maps. The *Telegraph* thereupon applied to the Sydney Observatory for a daily chart, to be supplied not later than 2 P.M., in order that it might appear in the evening editions which reach the country in time for use in the schools the

next day. Since October 11, 1904, the daily weather map (isobars, wind direction and shaded areas of rainfall) has appeared regularly in the *Daily Telegraph*. The newspaper supplies the observatory with a small number of reprints of the maps each day, and through the courtesy of Mr. H. A. Hunt, acting meteorologist, New South Wales, the compiler of these notes has received a set of the maps bearing dates from May 24 on. We have no doubt that general interest in meteorology will be greatly stimulated by the publication of these weather maps in the *Daily Telegraph*. In the United States several papers have at odd times attempted a daily publication of weather maps. There is at present at least one newspaper, the Boston (Mass.) *Herald*, which still prints them regularly. A short account of 'The Newspaper Weather Maps of the United States' appeared in the *American Meteorological Journal*, Vol. XI., 1894–5, pp. 96–107.

METEOROLOGY OF THE 'SCOTIA' EXPEDITION.

R. C. Mossman, meteorologist of the *Scotia* Expedition, contributed to the August number of the *Scottish Geographical Magazine* a discussion of the meteorological results obtained after October, 1903, chiefly concerning the observations at Laurie Island, South Orkneys. The observations made at sea and at the Falkland Islands will be discussed later. The station at Laurie Island has, it may be remembered, been taken over by the Argentine Meteorological Service since February 22, 1904. One of the most interesting meteorological phenomena is the *foehn* winds. These come from the west-northwest over a considerable area of high land, and may produce as high a temperature in midwinter as in midsummer. Inversions of temperature were common during anticyclones. The summer is the cloudiest season, as is usually the case in the polar latitudes. The prevailing wind direction is northwest and west-northwest. Precipitation, chiefly granular snow, amounted in 1904 to 10.41 inches, although the actual fall may be fifteen inches. Thunder-storms occurred twice, and distant lightning was seen twice. The cyclones show a very rapid fall of the barometer in the front, and a slow rise in the rear. The rapid fall is associated with light winds, but heavy gales prevail on the rear.

LOSS OF SLEEP AND HIGH MOUNTAIN ASCENTS.

Dr. Bullock Workman, whose high mountain climbing in the Himalayas is well known, has recently brought out the point that very high ascents may be rendered impossible by loss of sleep due to the difficulty in breathing while lying down. He notes that while in camp at 19,358 feet his party was kept awake by lack of breath, and when the members dozed off, they would awake with a start, gasping for breath. Dr. Workman adds: "If camps could be established at heights of 23,000 feet to 25,000 feet and above, as they would have to be, sleep might be entirely prevented or interfered with by deficient oxygenation of the blood to such an extent that a party would be incapacitated from this cause alone from going any higher." (*Bull. Am. Geogr. Soc.*, XXXVII., 1905, 671.)

NOTES.

In *Symons's Meteorological Magazine*, September and October, 1905, R. H. Curtis urges the use of Beaufort's scale by observers on land who have not anemometers, and suggests that such observers would make much more accurate estimates of wind velocities if they accustomed themselves to associating the observable effects of the wind with the actual wind velocities, which could be published every day.

The crop of meteorological observations made during the recent solar eclipse is beginning to be gathered in. Among the data published we note the following: At Falmouth (England) the thermograph showed a slight depression at 12:30 P.M., and the fall continued slightly until 1:15 P.M., well after the maximum phase. The barometer rose throughout the day, with a little more pronounced rise between 1 and 2 P.M., but no irregularities were noted. At Broughton-in-Furness a decline of temperature was distinctly shown, from nearly 60° at noon to 56°

at 1:15 P.M., when a rise began, giving 60° again at 3 P.M.

WE learn from *Symons's Meteorological Magazine* (November, 1905) of the establishment of a lectureship on meteorology in the University of Manchester. Mr. George C. Simpson, who occupies this position, is the first university lecturer on meteorology in Great Britain.

R. DEC. WARD.

THE NEW ENGLAND INTERCOLLEGIATE GEOLOGICAL EXCURSION, 1905. GEOLOGY OF THE NANTASKET AREA.

THE New England Intercollegiate Geological Excursion for the year 1905 was held at Boston, on Saturday, October 28, under the auspices of the Massachusetts Institute of Technology. Professor T. A. Jaggar, Jr., was in charge, Professors J. B. Woodworth, of Harvard, and D. W. Johnson, of the institute, cooperating in the work.

On Friday evening, October 27, an informal conference was held in the library of the department of geology at the institute, the meeting being well attended. Professor Jaggar outlined the plans for the following day, and presented a brief account of the geological history of the Boston Basin, together with a more detailed description of the lava flows, dykes and sediments of the Nantasket area. Professor Johnson followed with a discussion of the recent changes which have taken place in the drumlins and beaches of the harbor, particularly those which have affected the development of the present Nantasket Beach.

The party, consisting of forty-five teachers and students, left South Station at 8:43 Saturday morning, going by train to Point Allerton at the northern end of the beach. After noting the different stages of marine erosion shown by the remnants of the Allerton drumlins, the party walked southward along the old abandoned beaches which were formed a considerable distance west of the present shore. The consecutive stages in the development of the present form of Nantasket could be made out from the succession of beaches with intervening 'slashes,' converging at the north to pass a little south of Point Allerton Hill (drumlin), and indicating a former seaward extension of the beaches; and converging at the south to join the northern side of the Strawberry Hill drumlin. It was seen that the smaller waves from the protected harbor are now cutting into these older beaches from the west, destroying the work accomplished by the larger Atlantic waves in a former time, and building out to the northward a much smaller beach made up largely of the material eroded from the older beaches. The presence of a peculiar protuberance in the outline of the western shore was shown to be due to the former existence of a drumlin at that place, the drumlin having been removed largely by marine action, but partly by man. The splendid example of an abandoned marine cliff on the southeast side of the Strawberry Hill drumlin, the prominent crescentic cliff in the next drumlin well to the south, and numerous minor 'nips' in the several drumlins, indicate successive positions of the eastern shoreline as the different beaches were added without any apparent change in relative elevation of the land, and point to the probable existence of former drumlins which profoundly influenced the development of the beaches, but which have since been destroyed by the waves. The general features of this succession were called to the writer's attention by Professor Davis, of Harvard, and the detailed study of the region forms the subject of a paper which will be presented at a future time.

After the study of the old beaches and abandoned marine cliffs the party divided into two sections, one division under the direction of Professor Jaggar, the other under that of Professor Woodworth. The detailed structure of the Nantasket ledges of south-dipping conglomerates, slates, lavas, breccias and sandstones were pointed out, and the origin of the most interesting features discussed. Intersecting dykes of diabase, sometimes containing inclusions of the underlying granite, sometimes almost entirely removed from between the hard walls of country rock by the action of the waves, afforded many points of interest. The 'volcanic bombs' in the melaphyr, and the extensive beds of conglomerate contemporane-