ne saws, lying either side of the ovipositor.' Nor, if a cicada is referred to, does the description of the method of oviposition accord with the fact. Finally, it might be desirable for Mrs. Williams to get the real facts concerning honey bees, that the rate of her 'fair intelligence' in middle Tennessee be not fixed unjustly low.

J. B. S.

CURRENT NOTES ON PHYSIOGRAPHY.

THE HIGH PLAINS OF COLORADO, KANSAS AND TEXAS.

THE attractions of the diversified Cordilleran region have caused the relative neglect by the geologist and the geographer of the more monotonous area of the Great plains during the last thirty years of exploration. Following the recent increase of attention to this extensive area, we now have an admirably lucid report on 'The High Plains and their Utilization,' by W. D. Johnson (21st Ann. Rep. U. S. Geol. Surv., pt. IV., 1901, 601–768, many excellent plates and figures), giving description and explanation to a stretch of the highest and smoothest part of the Plains, from 150 to 200 miles east of the mountains, in Colorado, Kansas, Texas and New Mexico. The largest continuous area here included is that of the Staked plains, between the Canadian and Pecos rivers, but more attention is given to certain smaller areas, separated by successive west-east valleys and extending through Kansas and Colorado northward towards Platte River. The strata of the High plains are chiefly silts, irregularly interstratified with gravel and sand in linear arrangement, but in lines slightly divergent and crossing. Silt is the most abundant material, yet coarser deposits are so plentiful that the whole loose accumulation is sometimes referred to as the 'Tertiary gravel.' This extensive deposit, in some places 500 feet thick, is the product of aggradation by braided or laced streams, whose load of material from the mountains could not all be carried across the gentle slope of the Plains. Evidence of this origin is found not only in variable composition and irregular stratification, but also in the trains of well-rounded gravel, derived from the resistant rocks of the mountains, stretching forward with the slope of the Plains, and becoming finer textured eastward. The lacustrine origin of these strata, usually advocated heretofore, but discountenanced by Gilbert and Haworth, is considered by Johnson and again rejected on good grounds. The fluviatile deposits mantle an uneven surface of older rock, eroded by an ancestral drainage system. They originally formed a vast 'débris-apron' of numerous laterally confluent river fans of long radius, with continuous slope eastward from the mountain base. The region was then a fluviatile plain of great dimensions, similar to that which to-day stretches southward from the base of the Himalayas, in northern India, and similar to the extensive piedmont fluviatile plains of mountain waste that are so commonly and appropriately associated with great mountain ranges in one or another phase of their maturity. But the High plains are now trenched by the west-east valleys worn by the successors of the streams that built the plains; this being the result of some change (preferably the increase of rainfall that accompanied the glacial period) whereby the capacity of the streams to erode was restored. Moreover, the fluviatile mantle has been worn away along two north and south belts. One is the arid belt near the mountain base, where vegetation is so scanty that the small rainfall has sufficed to wear away much of the river-made strata in the excavation of lateral valleys. The other belt begins 100 or 200 miles further east, where the rainfall is heavier and where the headward (westward) growth of many streams is pushing back a badland escarpment. Between these two degraded belts the tattered remnants of High-plains mantle are still smooth and uncut, because under their subhumid climate they have a close-knit cover of sod which has held fast under their light rainfall.

The dead-flat upland of the High plains is lightly pitted here and there by shallow circular depressions, up to 1,000 yards across. These hollows are not due to wind action, for however dusty the gales may be on the arid belt further west, the winds blow clear on the sodded plains. Some of the hollows are crater-like; many are encircled by cracks and rims of slightly settled grounds, and all except the small 'buffalo wallows' are regarded as sinks

due to some action of underground water. Being out of the reach of irrigation from the rivers, and not having enough rainfall for agriculture, the utilization of the High plains must be chiefly as cattle ranges for which water may be gained by wells and windmills.

SOUTH SHORE OF HUDSON STRAIT.

THE forbidding character of a rocky upland that has been recently and severely glaciated and that still possesses a severe climate is well portrayed in Low's 'Report on an Exploration of Part of the South Shore of Hudson Strait * * *' (Geol. Surv. Canada, Ann. Rep., XI., 1901, L.): "The rocks met with are all of great antiquity, and all are more or less altered by pressure, induced by intrusions of igneous masses which have folded the bedded series and have produced foliation in much of the otherwise massive granites, gabbros," etc. (p. 31 L.). The crystalline rocks usually form a highland which reaches altitudes between 1,000 and 2,000 feet near the sea, and is often plateau-like in the extent of its rolling uplands between deep and sharp-cut valleys or canyons. Here rock and boulders are abundant and soil is very scanty; here are abundant lichens and some flowering plants, but no trees. Elsewhere the rocks are stratified and gently inclined, forming low ridges with steep outcrop faces and gentle back slopes. Below 300 feet the surface is generally mantled with marine clays, marked with terraces. But as the land rose from its postglacial submergence, the headlands "have been smoothed and polished by the pounding of floating ice, which has removed nearly all the drift from the points, leaving the solid fresh rock always exposed."

THE ORIGIN OF WATERFALLS.

THE 'Festschrift des Geographischen Seminars der Universität Breslau zur Begrüssung des XIII. Deutschen Geographentages' contains, among various essays, most of which turn toward historical geography, an article on the Origin of Waterfalls, by F. Sturm (pp. 122–132, Breslau, 1901). Besides the numerous rapids and falls which originate at points where a young stream passes from a more to a less resistant rock, or where a new course has been taken in consequence of drift barriers, a number of special cases are instanced, such as rapids in a main stream where side streams form boulder dams, illustrated by the Colorado in its canyon; rapids occurring where travertine is deposited in a stream channel, as illustrated at several points in Bosnia, and falls over fault escarpments, such as those of the Oxara in Iceland. The order in which different kinds of falls are presented is empirical rather than genetic.

Falls at the mouths of hanging valleys are explained as resulting from the faster erosion of the main than of the side stream; strong glacial erosion of the main valleys in excess of that in the side valley is discredited. It is not noted in this connection that hanging side valleys with falls leaping from their mouths into broad-floored main valleys are known only in glaciated districts; and that in non-glaciated areas, side streams 'hang' above their masters only in the earliest stage of a new cycle; accordant junction of side and main stream being developed about as soon as the main stream has graded its channel, and long before it has broadly opened its valley floor.

W. M. DAVIS.

CURRENT NOTES ON METEOROLOGY.

METEOROLOGICAL EQUIPMENT OF THE 'DISCOVERY.'

THE meteorological equipment of the British Antarctic exploring vessel *Discovery* is described by Dr. H. R. Mill in *Symons's Meteorological Magazine* for September. The Stevenson screen contains a wet and dry bulb thermometer, a mercurial maximum, and a Six's maximum and minimum thermometer. A barometer, on the Kew pattern, is in the magnetic house, and a barograph is kept in one of the companions. A thermograph and a hair hygrograph are placed on the outer wall of the magnetic house. The three recording instruments are kept running to Greenwich time. The temperature readings are checked by means of an Assmann Aspiration Psychrometer, and sling thermometers are also provided for comparison. Rainfall observations are to be made with a marine rain-gauge and evaporator of Dr. Black's pattern. For carrying out observations in the free air, a captive balloon is carried, and kites