reading-room in Christiania, for a complete catalogue of the literature of internationalism, a school, the printing of books and periodicals and the establishment of another arbitration court. These are highly creditable projects, but the Nobel Fund was given for another purpose. All the countries of the world have the same interest in it as Norway and Sweden, and they have a right to protest against its misappropriation.—*The Independent,* May 9, 1907.

CURRENT NOTES ON LAND FORMS

PIT CRATERS IN MEXICO

Among the many basins of the Central Plateau of Mexico, bordered by volcanoes in various stages of growth and dissection, and smoothly floored with aggraded layers of volcanic ashes and dust, of fluviatile and lacustrine desposits, and of occasional lava flows, there is one of typical development in the state of Puebla, east of the city of Mexico and separated by the volcano of Orizaba and its neighbors from the dissected escarpment by which the descent is made from the highland to the coastal lowlands. Ordoñez gives a good account of this basin-plain and of the pit craters that have been formed in it by explosion ("Los Xalapascos del Estado de Puebla," Inst. Geol. Mex., Parerg., i, 1906, no. 9). The plain is like all its fellows in having risen on the irregular flanks of the larger and smaller, younger and older volcanic masses that enclose it, and in being interrupted by more or less completely isolated volcanic knobs and ridges which rise here and there through its smooth surface. The gentle ascent by which one ordinarily approaches the border of an explosion crater is an insignificant element of relief in comparison with the much larger volcanic forms on all sides; indeed, the slope is sometimes hardly perceptible, and the depression of the crater, 1,000 to 1,800 met. in diameter, and 50 or more met. deep, is come upon as a surprise for which there is no warning at a little distance. A shallow blue lake usually occupies the floor; the walls are frequently steep and expose good sections of the layers by which the plain has been built up; special interest attaching to such items as buried stream channels and occasional thin lava sheets. Paths lead down in zigzags on the steep face or more directly by centripetal ravines; for the poor natives in neighboring villages have long been accustomed to carry water up from the lakes for domestic uses. Ordoñez regards these craters as among the latest manifestations of volcanic activity, and characterizes them as seeming unduly large for the feebleness of the explosive force which produced them.

BATOKA GORGE OF THE ZAMBESI

Among the results of the British Association visit to South Africa in 1907 is an account of "The Geology of the Zambesi Basin around the Batoka Gorge," by G. W. Lamplugh (*Quart. Journ. Geol. Soc.,* LXIII., 1907, 162–316), which includes an excellent description of a plateau in a youthful stage of dissection. In the region of Victoria Falls, the South African highland is built up of basalt sheets; older rocks, including a fundamental complex of gneiss, schists and granite, appear to the northeast and southeast. The relief is small; occasional residual knobs—*Inselberge* of the German explorers—rise here and there in the crystalline areas; low escarpments traverse the belts of inclined strata bordering the crystallines; broad swells of sand, supposed to be wind deposits of an earlier and more arid period, are spread over the basalts. The present altitude of the plateau is 3,000 feet or more. The upper Zambesi is a wide, placid river flowing through a shallow valley, bordered by low slopes of greatly decomposed basalt; its branches are of gentle fall and their valleys (called "channels" by Lamplugh) are but little below the general highland level. At Victoria Falls, the river plunges down 360 feet into a narrow gorge with nearly vertical walls, in which the peculiar zigzag turns have been well explained by Molyneaux ("The Physical History of Victoria Falls," *Geogr. Journ.,* XXV., 1905, 40–55) as the result of groups of obliquely transverse joints. In 60 miles below the falls, the river descends about 400 feet, and the walls of the gorge become more and more open. At the same time, the side gorges increase in length,

so that a widening area of sharply dissected country, very difficult to traverse, extends eastward from the falls, on each side of the main gorge. Some 300 miles east of the falls, the Kafue river, coming from the north, flows in a broad shallow valley for several hundred miles across the undulating plateau country, then plunges down through a succession of cataracts in a rugged gorge, descending 1,000 feet in two miles, after which it has a sluggish course of 20 miles to its confluence with the Zambesi.

The systematic manner in which the forms appropriate to old age on the plateau are replaced by those appropriate to youth in the gorge and its branches gives new warrant—if any new warrant is needed—for the use of a systematic terminology in the explanatory description of land forms. The structure of the region being stated in the first place, it suffices to say that the old features of the plateau are replaced by young features of strong relief below the falls; all the more characteristic forms may then be easily inferred. The space saved by the adoption of this concise style of description may then be used to advantage for accounts of individual features. For the highland area, "shallow valley," "shallow trough" and "channel sunk very slightly below the general level of the plateau" are the paraphrases which Lamplugh uses instead of the systematic term, "old valley"; the fact that three different descriptive phrases are thus used in a single article for one and the same class of forms only emphasizes the need of the adoption of a single, definite, technical term.

A PENEPLAIN IN SOUTH AFRICA

DURING the excursion of the British Association to South Africa in 1905, the undersigned had opportunity of traversing the High Veld of the interior on several different lines, and thus of gaining a general impression of its leading features (see "Observations in South Africa." *Bull. Geol. Soc. Amer.*, XVII., 1906, 377–450). As to structure, the region is broadly covered with a heavy series of nearly horizontal Mesozoic continental formations, resting unconformably on a complicated series of much older rocks, which appear to have been reduced in pre-Mesozoic time to the state of subdued mountains or hills, and which have since suffered still further reduction in the long continued cycle of erosion by which a vast body of material has been swept away. The present nearly-level highland of the treeless plains bevels across the Mesozoic strata at very gentle angles, and except for the scattered strong reliefs in the form of stony ridges and mesas maintained by resistant dolerite dikes and sheets, the surface has truly reached an expression of penultimate erosion. The low swells between the water courses have a thin soil; they are often of very faint convexity, nicely indicated by the faint arching of the long railway tangents. The water courses, unlike the broad and ill-defined wadies in the peneplain in equatorial Africa described in SCIENCE for August 2, 1907, are deep, well-defined channels, bordered by 20 or 30 feet of alluvium which cloaks the wide-open old-valley floors. The channels were nearly dry at the time of our visit, but bore the marks of having carried heavy floods in previous wet seasons (southern summer) when heavy local downpours occur. A curious minor item was the occurrence of rapids in the dwindled streams of the dry season, where rock sills occurred in the deep channel beds: this at first suggested a recent revival of erosion; but it was afterwards better understood that the long established grade of these old drainage lines is indicated by the even slope of their alluvial flood-levels and not by the small inequalities in their flood-scoured beds. Where the water courses lead through notches in the dolerite ridges, the channels are encumbered with boulders and their fall is more rapid than elsewhere; thus the Veld is divided into compartments of slightly different altitudes.

The Veld stands at altitudes of from 6,000 to 8,000 feet, with a gentle slope to the west, which turns a large drainage area to the Orange River system. The eastern border of the Veld is suffering invasion by the head ravines of actively retrogressive streams that descend rapidly to the coastal lowlands of the Indian ocean; and this feature, along with certain other indications, led to the belief that

the peneplain of the Veld had probably been worn down with reference to the normal base-level of the ocean when the region stood several thousand feet lower than now; and that its uplift is so recent that, over most of the surface, the long, west-flowing rivers have not yet had time to deepen their valleys in their upper and middle courses. Farther towards the Atlantic, it is to be expected that a beginning of incision must already have been made; but critical observations are lacking in that direction.

Further physiographic results of the same excursion are presented in an article on "The Mountains of Southernmost Africa" (*Bull. Amer. Geogr. Soc.*, XXXVIII., 1906, 593–623), where the heavy Mesozoic series and a conformably underlying Paleozoic series are folded in well-defined east-west anticlines and synclines, apparently peneplained in one cycle and greatly eroded in a second, with the result of developing a remarkably well-adjusted drainage system, containing excellent examples of subsequent and resequent streams, as well as of deep-cut transverse water gaps in the ridges. Many of the ridges are anticlines, and serve admirably to correct the prevailing misapprehension that the ridges of long-eroded mountains should be of synclinal structure.

W. M. D.

DEDICATION OF THE ALDROVANDI MUSEUM OF THE UNIVERSITY OF BOLOGNA, ITALY

With felicitous ceremonies, extending through June 11–13, the University of Bologna has dedicated to the memory of the illustrious seventeenth century Bolognese naturalist, Aldrovandus, a new geological museum. Amongst the foreign universities represented were Glasgow, Oxford, Cambridge, Berlin, Königsberg, Breslau, Halle, Vienna, Paris, Upsala, Christiania, Pennsylvania, Yale, Michigan, Cornell, etc.

The addresses on the principal day were delivered before a distinguished audience in the Archgymnasium, Senator Capellini, president of the University of Bologna, presiding. Following his eloquent address, a study of the *motif* of the occasion was given by Professor Costa. Responses from foreign countries were given by Professors Brusina, of Agram; Pélissier, of Montpellier; Ferguson, of Glasgow; Schück, of Upsala; Borcea, of Rumania; Richter, of Hungary, and Dr. Wieland, of the Carnegie Institution of Washington. The celebration was finally concluded by a dinner tendered the delegates by the mayor of Bologna.

The University of Bologna enjoys the proud distinction of being the oldest university in Europe, and possesses in addition to fine zoological collections, paleontological collections of great importance, as well remembered by Americans, due, largely, to the indefatigable efforts of Senator Capellini, now extending through a period of fifty years. This ancient university, so thoroughly imbued with the spirit of modern research and enterprise, is indeed to be congratulated on thus coupling the deep historical interest of the vast and wonderful pioneer labors of Aldrovandus, whom Capellini happily compares with Aristotle, with twentieth century science.

G. R. W.

CENTENARY OF THE GEOLOGICAL SOCIETY[1]

In September next the Geological Society will celebrate its hundredth birthday. In honor of this interesting occasion preparations have for some time been in progress. Invitations to the celebration have been issued to all the foreign members and foreign correspondents of the society; the various geological surveys all over the globe, universities having chairs of geology or mineralogy, scientific academies, societies and museums at home and abroad have been invited to send delegates to London. The large number of acceptances already received include the names of many of the most distinguished geologists of the present day, both in the old and the new world.

It has been arranged that a series of excursions to various parts of this country shall take place before the centennial meeting,

[1] From *Nature*.