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Terraces of the Nile Valley

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TERRACES OF THE NILE VALLEY.

BY CHARLES R. KEYES.

(Abstract.)

Erosion forms in regions of very dry climates are always of great interest. The characteristic relief outlines are not only preserved much longer than in regions of abundant rainfall, but the types of different cycles or parts of cycles are not merged with one another. In other words, the sequence of events is read at a glance in the one district, while in the second it is made out only partially after long and laborious effort. The Great Basin is the best example in this country.

In the Nile valley, in lower Egypt, there is a similar group of conditions presented that we find in the Great Basin. The annual amount of rainfall is so scant (only about one inch) that the older European geologists who have visited the great delta and the valley opening out to the south have been unable to ascribe any of the hill terraces to the action of water. They have been pretty well agreed in considering the terraces as the result of faulting, though admitting that the terrace courses are remarkably sinuous and angular.

In some places the faces of the terraces do resemble fault-scarps. The appearance of some of these are shown in the accompanying photographs which represent the approach to the Mokattam hills, which form the high ground on the east side of the Nile, near Cairo. The photographs were obtained a few months ago while on a visit to the Nile country in company with Mr. Alexis Fry, of Boston, and Dr. Woodrow, of Columbia.

In the waddies, or deep ravines, running back from the main Nile escarpment the terraces are found to follow all the windings for several miles at least. Those of the several different levels are easily traced. Their concidence with the terraces of the main escarpment bordering the Nile precludes the idea of faulting as a satisfactory explanation of the terrace forms.

It is manifest in the waddies that torrent action is vigorous, though of course at irregular and long intervals. Moreover,

the presence of broad terraces at various elevations and other topographic forms indicate plainly the region has been one of recent oscillation and that the terraces mark stages in the cycles when for a considerable period little movement took place.

GENESIS OF NORMAL COMPOUND, AND NORMAL HORIZONTAL FAULTING.

BY CHARLES R. KEYES.

(Abstract.)

In the mining districts of mountainous regions the ore-bearing belts are quite often coincident with fault planes. These planes are not usually clean-cut, single slipping surfaces, but consist of a number of gliding faces distinct from one another, sometimes branching, sometimes crossing at low angles, and contain in their immediate neighborhood more or less brecciated material. This compound character of what we are prone to pass over as single, simple dislocation, is found, after a little careful examination, to prevail in the majority of cases.

As the slipping commonly occurs in districts in which folding of strata has been more or less intense, it is not frequently taken for granted that the dislocation is of the nature of reverse faulting. This conclusion is apt to be reached when the detailed proofs are obscure, or not clearly made out.

In many cases, in regions in which the strata have been folded, normal faulting is known to be of frequent occurrence. The illustrations are numerous. The beautiful examples depicted by Spurr in his recent work on the Aspen mining district of Colorado are especially noteworthy as typical developments of the normal compound, or normal horizontal faults. Although not clearly shown in his diagrams, in other localities it is known that the origin of the phenomena is due to a comparatively sudden relaxation of the pressure, allowing the crest of a fold to settle somewhat. When the strata are gradually bowed upward, they do not fracture but flow, as it were, into position; but when the compressing forces are relieved suddenly the layers cannot respond in the same way. They are broken.