

## ILLUSTRATIONS OF THE GEOLOGICAL HISTORY OF NORTHEASTERN PERSIA.

Although the portion of Iran which I traversed embraces but a small part of the entire basin, it affords illustrations of many phenomena characteristic of the entire region. These fall into groups illustrating, respectively, (1) the non-climatic or more strictly geological history of Iran during the Tertiary and Quaternary eras; (2) the physiographic results produced by an arid climate during the same time; and (3) the effects produced by climatic changes during the Quaternary era. Each of these groups will be considered in its relation to certain theoretical generalizations, and in relation to the geographic aspect of the country. The following illustrations of the geological history pertain first to the character and conditions of uplift of the mountains on the northeastern border of Persia; second, to the nature and appearance of the north-and-south break which separates the Persian and Sistan basins; and, third, to the conditions of warping and deposition in the numerous subsidiary basins.

## THE MOUNTAINS OF KHORASAN.

The term Khorasan is applied administratively to all northeastern Persia from Astrabad to the northwestern corner of Baluchistan. In a more restricted sense it is the name of the mountainous northeastern corner of the country centering about Meshed as a capital. As thus limited Khorasan is one of the most prosperous provinces of Persia, thanks to the considerable number of mountains which rise to the height of 10,000 feet or more; yet the prevailing aspect is one of sterility. The mountains are very scantily covered with soil, and support merely a few weeds and bushes and an ephemeral growth of grass in spring. Cultivation is almost confined to the valley bottoms and is dependent entirely on irrigation. Each village is an oasis in the midst of a desert, but compared with other parts of Persia the oases are large and numerous, and are often of great beauty, with their fringes of poplars and orchards.

This favored province of Persia consists of four parts. On the north lies the broad mountain mass of Kopet Dagħ, running northwest and southeast, and forming the boundary between Persia and the Russian province of Transcaspia. South of Kopet Dagħ lies the so-called valley of Meshed, a narrow cigar-shaped basin or depression. This is bounded on the south by the Binalud range, which runs from the Afghan border northwestward parallel to Kopet Dagħ as far as Kuchan, and then turns southwestward until it joins the Elburz Mountains southeast of the Caspian Sea. Within the great arch of the Binalud range lies the fourth division of Khorasan, the little-known basins of Isferayin, Jaga-tai, and Nishapur, together with the mountains which hem them in. South of all stretches the fearful desert of the Dasht-i-Kavir or Dasht-i-Lut.

## KOPET DAGH.

If the line of the Caucasus Mountains be projected across the Caspian Sea it reappears in the low, isolated, and half-buried ranges of the Great and Little Balkhans. Toward the southeast these mountains become broader and higher, and rise into the distinct range of Kopet Dagħ, or Kopet Mountain, which, with an