

of eight drops of a fresh, virulent culture in the region of the triceps brachialis produces a hot and painful swelling, which hinders the movements of the arm; following this comes a localized fever, which soon disappears; three hours after the injection, this phenomenon commences, continues about twenty-four hours, and then all effects disappear completely. If an injection of five-tenths of a cubic centimetre be made in each arm, the local symptoms are intensified, and general symptoms appear. These general symptoms bear an undoubted resemblance to true cholera; as, general coldness, rigors, lassitude, cramps, vomiting, dull mind, cold and clammy sweats, more frequent evacuations (but never reaching the true diarrhoea of cholera).

All of these symptoms are followed by a general rise of temperature, reaching even 2.5° C. above normal. More frequently there are more or less accentuated chilliness, general lassitude, dulness, desire to vomit, and fever. All of these symptoms cease at the end of from twenty-four to thirty-six hours, without necessity for a recourse to therapeutics. Sometimes they are more severe, and the blood from any part of the body gives the same microscopic appearances as in animals.

If, six or eight days after the injection of five-tenths of a cubic centimetre in each arm, the same dose, and of the same virulence, be injected into the same subject, the general symptoms do not occur, whilst the local phenomena are much less severe.

The writer draws these conclusions from his experiments, and offers to reproduce his results before the academy: 1°. "Choleration is possible in man, as in animals, by hypodermic injection." 2°. "The prophylaxis of choleration is obtained through graduated doses, or attenuated virus."

Dr. Ferran, no doubt to add weight to his paper, gives the names of twenty-four physicians, five medical students, five other males, and five females, upon whom he has experimented.

These experiments are said to have been carried on farther, but no proper report of them has as yet reached us. Our criticism would be that the conclusion as to the efficiency of the inoculation against cholera, granting that the true bacillus of cholera was used, is an exceedingly hasty one, inasmuch as the protected (?) persons had not yet been brought in contact with the disease.

HERAT'S IMPORTANCE.¹

THE reasons for the importance of Herat are of three kinds, — geographical, ethnological, and historical.

With regard to Herat's geographical situation, it will be seen at once that from Siberia to India, with the exception of the oasis in the Zerafshân basin, there is scarcely a point to be found which can bear comparison with Herat in regard to fertility and climatic advantages. Lying on the western and

northern spurs of the Paropamisus Range, which is connected with the lower mountain range of Persia by the ridge of Siah-Bebek, the district of Herat is provided with an extraordinarily full river-system. Water, the most important auxiliary of agriculture in Asia, is therefore to be had in plenty; and the canals leading from the numerous water-courses, can, in consequence of the undulating surface of the district, be turned to account for irrigation in a very effective manner. Under the protection of political quiet, and with moderate industry, Herat could easily be turned into a garden; and that it frequently has indeed been a fruitful garden, whose manifold productions have awakened the envy of the neighboring powers, we have the testimony of history.

In regard to climate, Herat is equally favored. While with two degrees north or south the heat becomes unbearable, Herat enjoys a surpassingly mild climate, under whose influence the products of the north and the south ripen in equal perfection, and an agreeable habitation for mankind has always been provided.

It is no wonder, then, that the western district of Herat, commonly called Baghiz, was, even in antiquity, described by the geographers with enthusiasm. Ibn Haukal, Mukadassi, Edrisi, and others call Baghiz the 'crown of Khorasan:' the author of the geographical work 'Heft-Iklim' calls it a flower-garden of enchantment, with a thousand vales of trees and streams, — a camp-ground rich in grass and water, peculiarly suitable for the resting-place of the largest armies.

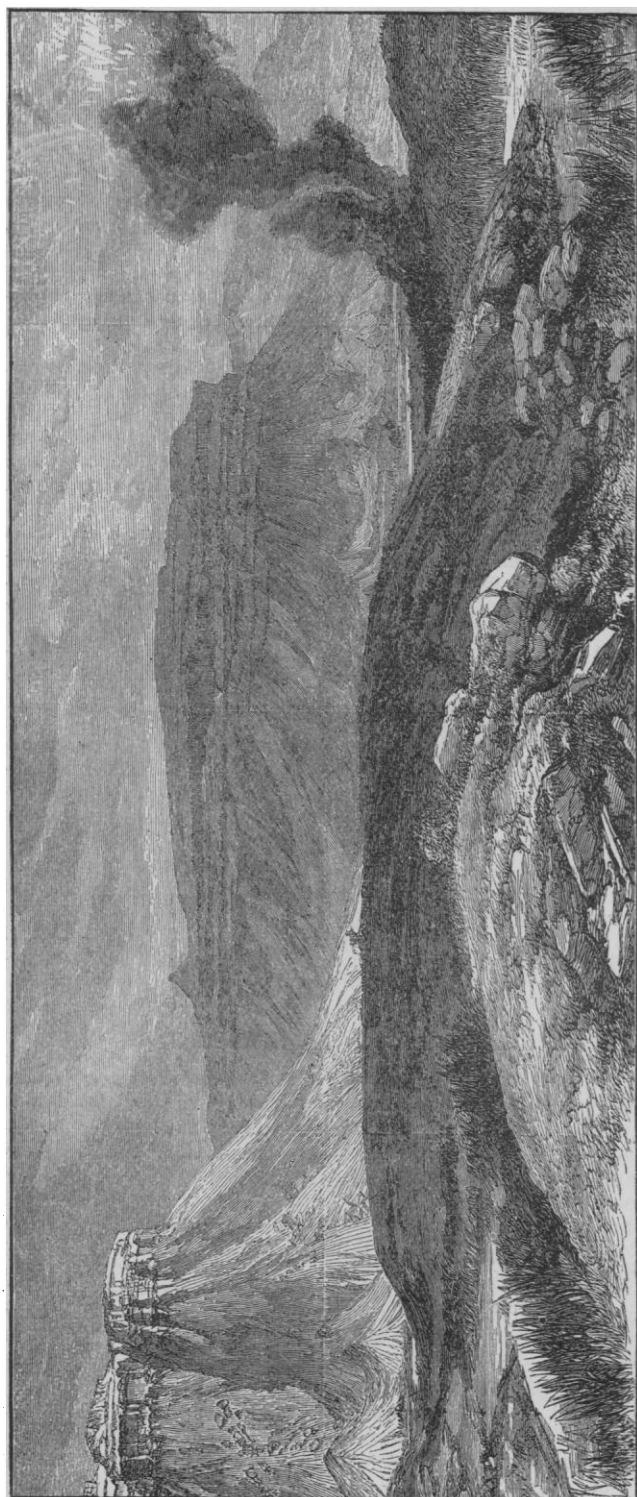
Indeed, this fame extends back even to pre-Islamic times. Herat's wealth was proverbial; as witness the expression, "Khorasan is the mussel of the world, and Herat is its pearl."

As to the boundaries of this Baghiz, which to-day figures as the cause of the quarrel between England and Russia, they have been understood from the earliest times to be, on the west the Hari-Rud, and on the north the edge of the steppe, which, extending from Pul-i-Khisti to Shir-Tepe, marks the line between the cultivated oasis and the bottomless sand-desert.

In passing now to the ethnical features of Herat, it is to be noticed at the outset that it is exactly the miscellaneous character of the population which makes the work of conquest easy, and furnishes such means of civilization as would be sought elsewhere in vain. Among the million and a half inhabitants of Herat and its surroundings, the autochthonous Iranians hold the first place. For the most part, they are dwellers in towns, and have at all times distinguished themselves by their industry, perseverance, and special intellectual talent. It was they who produced so many brilliant periods of the Moslem culture; and the literary productions of the Herat writers, as well as the monuments of Herat artists and architects, are still subjects of admiration.

The population of the outlying districts bears the general name of Tshehar-Eimak, — i.e., four tribes, — and traces its origin back to the times of the Timurides. The former word is of Persian origin;

¹ From an article by H. VAMBÉRY in the *Oesterreichische monatschrift für den orient*.

ZOLFİKAR PASS. (*London illustrated news.*)

the latter, of Mongol-Turkish. Of these four tribes, the Dshemshidis are the most important. They were formerly much more numerous than now. To-day they number about six thousand families, of which four thousand dwell at Kushk, a place near the sources of the river of the same name; a thousand at Bala-Murgáb; and a thousand at Kurukh. Most of them lead a half or wholly nomadic life, and have adopted Turkish manners and customs, although favorable political circumstances might easily turn them into peaceful, industrious citizens.

Next to these come the Firuzkulis, whose territory extends from Bendi-Turkestan on the north, to the sources of the Hari-Rud on the south. They are also of Iranian origin, and fall into two distinct sub-tribes, — the Derzais and the Mahmudis. They comprise, in all, eleven thousand families, and their chief town is Kila Nau ('New Fortress'), which really lies in the territory of the Hazaras. At the present time the tribe of the Derzais dwells in the mountain region, while the Mahmudis occupy the lowland. The Teimenis, fifty thousand families strong, live in the region lying south of the Hari-Rud, and, in spite of their unmistakably Mongolian origin, have become completely settled, and even enjoy the reputation of being excellent cultivators. The fourth member of the Tshehar-Eimaks is the tribe of the Teimuris, who inhabit the western part of the Baghiz district, and are at home at Pul-i-Khatun, Germ-ab, the pass of Zolfikar (a cut of which is here reproduced from the *London illustrated news*), and along the whole eastern boundary of Persia. They number about fifteen thousand families, and form the ethnical element, so to speak, which first brought about the difficulty between the two European rivals.

Taken all in all, the inhabitants of Herat form, indeed, the best possible element for the designs of a foreign conqueror; for they have been accustomed for centuries to foreign rule, and, with slight exceptions, are hostile equally to the Uzbek on the north, the Afghan on the south, and the Persian on the west. Their greatest political ambition, the independence of Herat, has seldom been realized; and if now, when European conquest is extending to this part of central Asia, either the Russians or the English should succeed in becoming estab-

lished here, they would find in the ethnical relations such a basis of power, and accordingly obtain such a firm foothold, that their dislodgement would be no easy task.

We have still to speak of the part which Herat, for the very reason of the advantages referred to above, has played in the past. Herat is to-day, to some extent, the centre of trade between India, Persia, and central Asia, where new goods are exchanged, the packages are overhauled and re-arranged, and the caravans spend some days, or even weeks, in resting for their farther journeys. And so, in antiquity, Herat was the point from which almost all the conquerors of India and western Asia set out. Alexander the Great stopped there in 327 B.C.; the Mongolians under Dshengiz halted there in 1220 A.D., before going on to the Indus; Timur passed through Herat on his march toward India in 1381; Sheibani Khan, the Uzbek prince, was intending, in the beginning of the sixteenth century, to start from Herat to India; and Nadir Shah, in 1731, did not dare to attempt the way toward southern Hindostan until he was in possession of Herat.

History repeats itself everywhere with very similar episodes. What the early Mohammedan and Buddhist adventurers attempted when they crossed the Oxus, and, attracted by the rich treasures of India, went towards the south, is the same thing which the present successors and representatives of the Tartar warriors — viz., the Russians — are aiming at; for they, too, have an eye upon the fields of India, however much czars and ministers disclaim the fact, or Russian scholars talk of the 'noble mission of culture' fulfilled by the attempts of their army in Asia. If Russia had not already spent over four hundred million dollars in carrying out her policy in central Asia, and if this central Asia were not such a useless acquisition, which can never be a source of revenue, but always an expense, we might put some faith in these assertions; but no one is so simple nowadays as to ascribe persecution on the part of individuals or states to purely philanthropic or unselfish motives. Russia wants the 'Gate of India' in order to reach India; and the essential difficulty in her plan consists in the fact that the land on the Ganges and Indus is controlled, not by effeminate Brahmins, or the degenerate successors of Baber, but by the active, highly educated, and powerful Briton, and that any aggressor at present, instead of carrying home the golden gates of the palace of Somnath, as did Mahmud the Ghaznewid, would be much more likely to come off with a broken head.

COPE'S TERTIARY VERTEBRATA.

WHEN this immense work is completed by the issue of the second part, we shall have by far the most extensive and valuable survey yet

attempted of the tertiary vertebrates, which have been discovered in our western territories in such amazing profusion. Dr. Leidy's excellent volumes now cover but a small portion of the ground, which has been so greatly extended since they were written. In Professor Cope's new book, which looks as formidable as an unabridged dictionary, one hardly knows whether the vast collections which he has brought together, or the skill with which they have been worked up, is most to be admired; for this book is no mere wearisome compilation of descriptive details, but a notable contribution to morphology and the theory of evolution.

After a general account of the tertiary formations of the central United States, the introduction proceeds to a much-needed discussion of the correspondences between the geological periods of Europe and North America. This has often been attempted before; but the new material lately obtained sheds much light upon these vexed and difficult questions. In the paleozoic formations, these identifications can in many cases be made easily and certainly; but in the mesozoic, and still more in the tertiary, deposits, they become very problematical. A starting-point, however, seems to be given to us in the Wasatch of America, which seems to be the exact equivalent of the French Suesonian: later than that, the correspondences seem to be but general. Professor Cope still maintains his former view, that the Laramie (the great coal-bearing formation of the region west of the Missouri) is of cretaceous age. In this connection, it is interesting to compare with Professor Cope's arguments those advanced by Professor Lesquereux in his work on the cretaceous and tertiary flora, which has just been issued as volume vii. of this same series of reports. Professor Lesquereux attacks the problem chiefly from the botanical side, but, after reviewing all the evidence attainable, pronounces emphatically in favor of the tertiary age of the Laramie. It seems to us that Lesquereux makes out rather the better case, and that possibly the Laramie may prove to be contemporary with the earliest eocene formation of this country, the Puerco; the former being composed of swampy and estuarine deposits, and the latter of lacustrine. This view is much strengthened by the recent discoveries of Laramie dinosaurs in the Puerco, and of marsupials like those of the Puerco in the Laramie. Further evidence must, however, be awaited, before the hypothesis can be accepted.

It is to be regretted that Professor Cope

The Vertebrata of the tertiary formations of the west. By E. D. COPE. Book 1. (Rep. U. S. geol. surv. terr., vol. iii.) Washington, Government, 1884. 1,009 p., 135 pl. 4°.