

THE ARIDITY OF THE TURFAN AREA

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IN recent years much has been written about the desiccation of Chinese Turkistan, that vast region, largely desert, that lies between the Tien Shan in the north and the Kun Lun in the south. Learned explorers have been at pains to prove that the climate of this area has changed, and is changing, and that a process of drying up, in recent times, has taken place. Whether a change in the climate has taken place in the Tarim basin proper, within say the last fifteen hundred, or even a thousand years, is a very attractive subject for research. A recent visit to what may be called a subsidiary part of the Tarim basin showed certain signs that climatic changes of recent years—once again be it understood in historical times—could not with certainty be ascribed to diminished rainfall and atmospheric aridity.

The argument for desiccation is, it appears, that less snow, less water, and so less vegetation has been the sequence in Chinese Turkistan. The area under review is the Turfan district, a depression much below sea-level in certain parts. It has been argued that this tract of country supported a much greater population than it does now, and that the whole depression is much drier, and consequently less fertile, than it used to be: and that these changes are attributable to an altering climate.

Explorations in Turfan have brought to light many evidences of its former prosperity. Documents in many languages show that it was much frequented, and that its population was much larger than could now be supported. But did it in those days feed this population? Lying as it then did, at the meeting-place of the chief routes in this part of Asia, it collected a large and mongrel mass of inhabitants whom the facilities for trade attracted. But it is doubtful if for that reason the town fed itself. A large population was no more a proof of agricultural fertility a thousand years ago than it is to-day. Transport in Central Asia, at any rate Chinese Central Asia, remains the same as it was ten centuries ago; and the towns of Qara Shahr, Kurla, and Urumchi can no more feed themselves to-day than Turfan could in the past.

Indeed, observation of the Turfan depression points to the fact that it probably supports now a larger population than it ever did—although it grows cotton, which has to be bartered for cereals—and that the water is as abundant as ever it was. There are numerous beds of dry reeds, reeds which have perished many years ago, but what killed them was the deviation of the water for agricultural purposes. Near Turfan City several Karez, full of water, flowed beneath these buried stretches of dead reed; and at Murtukh the peasants were in February digging up the reeds to plant with maize the recovered ground.

Old ruins, abandoned houses, and the like, which abound throughout the depression are no index in Asia of an erst-while fertility. War, pestilence, and famine have rather been their downfall than any act of Nature. When a city has been destroyed by war, it is much easier for the timid peasants who creep back after the conquerors have gone, to start tilling new ground than to begin to clear away the heavy débris of ruined mud walls and fallen rafters.

Indeed, the ruined sites of Turfan appeared to bear no evidence of a

slowly drying and perishing land. At Qarakhoja the large walled city was side by side with the prosperous settlement of to-day, and inside its crumbling walls every clear or level space had been ploughed for the spring sowing. The large mass of ruins, 5 miles from Turfan city, stand on a high and crumbling promontory of loess. On both sides are abundant streams, and the valleys are thick with trees, and the houses and fields are eloquent of flourishing civilization. The city was doubtless supplied with water by a conduit in the days of its prosperity. But no sensible man would endeavour to cultivate it to-day, for the removal of the maze of mud and rubbish is well-nigh impossible.

On the south of the depression are the old remains of Chong Hassar and Kichik Hassar. One would appear to have been a fortress. The latter was a Buddhist stupa. When visited, the weather was perfect. It was a brilliant day in late winter. Chong Hassar was tenanted by a shepherd whose flocks were grazing on the surrounding herbage. There was abundant water about, and from the general aspect of the landscape, there was no evidence of either former cultivation or present desiccation. The fortress was built for protection: the monastery or stupa for seclusion. Indeed, it was remarkable in the district how old sites and new ones were intermingled—an indication that the water of one thousand years ago is still present.

Some of the finest trees in the plains of Turkistan were the willows along the Sengim road. They were as fine as well-grown English oaks, and the only ones that can compare with them are those at Bugur, between Kucha and Kurla. At Sengim, too, were old reeds, dead and desiccated. The same old reeds that are dug for fuel; but it was noteworthy that a new and vigorous growth of reeds was springing up side by side with their predecessors of bygone days.

It seems that a changing climate has been blamed for desiccation. But the alteration in the distribution of water seems a reasonable and equally plausible cause—always excepting political consequences, and the destruction and spoliation of the land by the victors, which has ever been the cause of ruined cities and ruined land in most parts of Asia.

It may be recalled that in India, particularly in the Southern Punjab and in Sind-Rajputana, whole rivers have vanished or have changed their course, yet this cannot be ascribed to alterations of climate.

Mr. Douglas Carruthers in his admirable work, 'Unknown Mongolia'—a book whose fault is that it is far too brief—describes (vol 2, pp. 458 *et seq.*) the desiccation in actual progress at the small settlement of Chi Ku Ching on the Hami-Urumchi road, immediately south of the eastern ranges of the Tien-Shan.

Since he visited this place a large Karez has been built. It flowed well for seven years, but then the lower or Chi Ku Ching end subsided. Consequently the water only flows at the farther extremity, where it is no use. Karez want to be regularly cleaned out. As the inhabitants of this miserable dusty little hamlet are not agriculturalists but live by swindling travellers, they were not interested in the success of the Karez. It was built by forced labour; and as there was no *corvée* to keep it in repair, it collapsed.

Chi Ku Ching is now three times the size it was when Mr. Carruthers

visited it. There is, however, abundant water 12 to 15 feet below the surface. Whatever desiccation is in progress, the cause must be a defect in the water, not the climate. The tamarisk mounds, cut away by æolian action and showing their dead layers of brittle root, are much in evidence, but it was interesting to note that by the side of these dead mounds there were also, in some cases but by no means in all, mounds covered with a vigorous growth of the living plant.

Undoubtedly in the Turfan depression, in the Tarim basin, and elsewhere areas are drying up, but it is suggested that the causes of this desiccation may perhaps be due to the failure of—not, be it noted, a lack in—the water supply. Subsidence below the surface, the blocking of some spring by rock, the tapping of the source elsewhere appear to be reasonable explanations. A change of climate in historical times would surely show itself more widely and more convincingly.

The great feature of Turfan to-day is the Karez. The whole district is dotted with the mounds that mark these subterranean watercourses. It is to these Karez, of comparatively modern introduction—say two centuries old—that Turfan owes its present prosperity. And their presence is proof that there is abundant water, now more skilfully used than before, in the area. What is more, tracts of land never before cultivated are being brought under the plough. All this points to no diminution in the water supply; and hardly supports the theory of a change, in modern times, in the climate.

Unquestionably Turfan is a hard land compared with the easy agricultural conditions of the southern parts of the province, where the water comes of its own free will wherever the cultivator wishes.

Here, in the Turfan district, the water has to be won with labour from under the earth, and the aspect of the country generally, as well as the conditions of tillage, crops, trees, etc., remind one of parts of the Punjab or North-West Frontier. The comparison is heightened by the range of rugged mountains to the north, glistening with snow, precisely as the Himalayas appear on a late winter's day from many parts of Northern India.

It does seem, however, that the theory of recent climatic changes in this depression should be regarded as open to some modification and amendment.