cause of an oasis of Moslem civilization developing between the barren sands of the Aral depression and the mountain tracts of the Tian-Shan. The Angren rises beneath the highest parts of the Tchotkat range, and its valley is the granary of the region. The Tchirtchik has its origin in the Borotday Mountains at the junction of the Tchotkat and the Pskem rivers, and at the point where it issues from the mountains it sends off the famous canal Zakh- aryk ; it flows past Tashkend along a valley 20 miles wide, and joins the Syr a few miles below its confluence with the Angren. The Keles comes from the Jity-su Mountains and also brings a large volume of water for irrigation. But owing to wars and continual insecurity cities formerly important have now been abandoned ; and near Tchinaz, at the mouth of the Tchirtchik, are the ruins of a large town formerly fortified with high walls, and of *aryks* with manifold ramifications.

Some 50 miles below Tchinaz (770 feet above sea-level) the Syr bends northwards, but resumes its north-westerly course 150 miles farther down, following with remarkable persistency the borders of the loess which fringes the moun­tains. Its low banks, covered with rushes and rendered uninhabitable in summer by clouds of mosquitoes, are in­undated for 20 miles on both sides when the snows begin to melt. These inundations prevent the moving sands of the Kizil-kum desert from approaching the Syr ; below Perovsk, however, the steppe gains the upper hand. Down to Perovsk the river rolls its muddy yellow waters, at the rate of 3 to 5 miles an hour, in a channel 300 to 600 yards wide and 3 to 5 fathoms deep ; at Perovsk its vertical section is 8220 square feet, and 312,500 cubic feet of water are discharged per second. The Arys and the Buguñ are the only tributaries worthy of notice on this part of its course ; the other streams which descend from the Kara-tau fail to reach the river. The Kungrad Kirghiz rear numerous herds of cattle and sheep in the valley of the Arys, while lower down, as far as Julek, the Igintchis carry on agriculture. All this applies, of course, only to the right bank ; on the left the moistness is absorbed by the hot winds which cross the Kizil-kum sands towards the river. The dryness of the atmosphere makes its influence markedly felt on the Syr when it enters, below Julek, a region where the Kara-kum sands extend on its right. Ten miles below Perovsk the river traverses a marshy depression—the bottom of a lake not yet fully dried up—where it divides into two branches,—the Jaman- daria and the Kara-uzyak. The latter spreads out in marshes and ponds, from which it again issues to join the former at Karmaktchi, after a course of 80 miles. The main branch also, owing to its shallowness and sinu­osity, is very difficult to navigate, and this is increased by the rapidity of the current and the want of fuel. Between Kazalinsk and the Sea of Aral (158 feet) the navigation becomes somewhat easier, except for the last 10 miles, where the river divides into three shallow branches before entering the “ Blue Sea.” All three have at their mouths sandy bars with only 3 feet of water, which are often forded by the Kirghiz.

Two former right-hand tributaries of the Syr—the Tchu and the Sary-su—which now disappear in the sands some 60 miles before reaching it, must be mentioned. The Tchu, which is 600 miles in length, rises in the Tian-Shan to the soutli-west of Lake Issik-kul, and is made up of many streams, of which the Kyz-art, the Juvan-aryk, and the Koshkar are the more important. On their union these form the Koshkar, which flows towards Lake Issik-kul, but a few miles before reaching that lake turns suddenly to the north-west, enters under the name of Tchu the narrow gorge of Buam, and, piercing the snow-clad Kunghei Ala-tau, emerges on its northern slope, having descended from 5500 feet to less than 2000 in a course of not more than 50 miles. In this part of its course it receives from the right the Kebin, whose high valley equals in size that of the upper Rhone. It then flows north-west­

wards through the valley of Pishpek, and, avoiding the Muyun-kum sands, describes a wide curve to the north before finally taking a western direction. Numberless streams flow towards it from the snow-clad Alexandrovsk Mountains, but they are for the most part lost in the sands before reaching it. The Tatas, 170 miles long, formerly an affluent of the Tchu, which rises in the highest parts of that range, pierces the Tcha-archa Mountains, and, flowing past Aulie-ata on the south border of the Muyun-kum, enters the salt lake Kara-kul 60 miles from the Tchu. The Tchu reaches the Saumal-kul group of lakes, 60 miles from the Syr, in the form of marshes with undefined channels. Another elongated group of lakes—-the Uzun-kul —near the above and 50 miles from Perovsk, receives the Sary-su, which has a length of nearly 570 miles, and flows rapidly in a narrow channel along the west borders of the northern Famine Steppe (Bekpak-dala).

The delta of the Syr at present begins at Perovsk, whence it sends a branch to the south-west, the Yany-daria (Jany-daria or New river), which formerly reached the south-eastern corner of the Sea of Aral, very near the mouth of the Amu-daria. The Kirghiz affirm that a canal dug for irrigation by the Karakalpaks gave origin to this river. It had, however, but a temporary existence. A dam erected by the Khokandese at Ak-metchet (Perovsk) caused its disappearance, and the Russians found but a dry bed in 1820. When the dam was removed the Yany-daria again reappeared, but it failed to reach the Sea of Aral ; in 1853 it lost itself in Lake Kutchka-denghiz, after a course of 250 miles ; all traces of its bed were then lost in the sand. The Kirghiz legend can only be accepted, however, with very great caution ; the present writer is inclined to think that the canal of the Karakalpaks was merely intended to redirect the waters of the Syr into a channel w’hich existed of old, but had been dried up.@@1 Certain it is that five centuries ago, in the time of Timur, the Yany-daria brought the waters of the Syr to the Dau-kara Lakes, close by the present mouth of the Amu. The series of old beds in the Kizil-kum, w’hich are still seen above Perovsk, shows that the Syr had a constant tendency to seek a channel to the south-west and that its present delta is but a vestige of what it was in past times. At a still more remote period this delta probably comprised all the space between the Kara-tau and the Nura-tau ; and in the series of elongated lakes at the base of the Nura-tau—the Tuz-kane and Bogdan-ata Lakes—we see an old branch of the delta of the Syr which probably joined the Zerafshan before reaching the Amu. The causes of this immense change are to be sought for simply in the rapid desiccation of the whole northern and central parts of Asia, due to the fact that we are now living in the later phase of the Lacustrine period, w’hich has followed the Glacial period. The extremely rapid desiccation of the Sea of Aral is proved even by surveys a few decades old, and this process is but a trifle in com­parison with the changes which have taken place during the last five centuries : the extension of the Caspian Sea as far as the Sarakamysh lakes during the Post-Pliocene period and the extension of the Sea of Aral at least 100 miles to the east of its present banks are both proved by the presence of Post-Pliocene marine deposits. (P. A. K.)

SYR-DARIA, or Syr-Darπnsk, a province of Russian Turkestan, in Asia, comprising wide tracts of land on both sides of the Syr-Daria river, from its entrance into the Sea of Aral up to Khojend, where it issues from the mountain region of the Tian-Shan. It is bounded on the N. by the Russian provinces of Turgai and Akmolinsk, on the E. by Semiryetchensk and Ferghana (ex-khanate of Khokand), on the S. by the district of Zerafshan, Bokhara, and the Russian province of Amu-daria, and on the W. by the Sea of Aral. Its area (166,000 square miles), its population (more than one million inhabitants), and its cities (Tash­kend, Khojend, Jizak, &c.) make it the most important province of Russian Turkestan ; and from its position between the mountain region of Central Asia and the great lake of the west Asian depression it is a region of deep interest for the geographer and geologist.

The south-eastern border of the province runs along the lofty Tchotkat Mountains. This chain, which separates the river Tchotkat from the Naryn, and runs for more than 200 miles from south-west to north-east, joining Alexan­drovsk Mountains on the east, raises its snow-clad peaks to an altitude of 14,000 feet. It diminishes in height towards the south, not exceeding 7000 feet in the barren Mogol-tau Mountains, but seems to be continued to the soutli-west by the Baisun-tau. A series of shorter chains—

@@@1 For the old beds of the Syr and the Amu, see Kaulbars’s “ Lower Parts of the Amu,” in *Mem. Russ. Geogr. Soc.,* Phys. Geogr., ix. (1881).