

The arrangements made during a short halt in the pleasant oasis of Kan-chou enabled me to set out by July 6th for the new surveys I had planned in the Central Nan-shan. Their main object was to extend the mapping effected in 1907 near the sources of the Su-lo-ho, Su-chou and Kan-chou rivers to the high ranges to the east of the latter's headwaters. In conjunction with our labours in the Etsin-gol region, they were intended to complete the surveys of those extreme north-western marches of Kan-su which, inasmuch as they send all their waters into drainageless basins, may well be considered in respect of their hydrography and general physical conditions as forming part of Central Asia rather than of China. Two marches brought Lāl Singh and myself by different routes to the foot of the mountains at Nan-kou-ch'êng, where fertile slopes cultivated without irrigation bore evidence to a distinct change in climatic conditions, foreshadowing our approach to the watershed of the Pacific Ocean.<sup>44</sup>

Proceeding thence eastwards we struck the route leading to Hsi-ning, and ascended by it through the gorge and pass of O-po to the broad valley where the feeders of the eastern branch of the Kan-chou river gather at an elevation of over 11,000 feet. Thence we were following it westwards over high alpine grazing grounds when I met with a serious riding accident which badly injured my left leg and made movement of any kind impossible to me for over two weeks. Fortunately the arrangements already made allowed Lāl Singh to carry on the topographical work I had planned. He thus reached Ta-ssu where the two branches of the Kan-chou river unite before breaking through the mountains northward in deep-cut gorges impassable except in the depth of winter and as yet unexplored.<sup>45</sup> He then ascended the western and larger branch of the river to beyond the short stretch we had followed in 1907, and thus supplemented very usefully our preceding surveys of the To-lai-shan and Richthofen ranges.<sup>46</sup>

I had myself intended to cross the former to the headwaters of the Ta-t'ung-ho and to survey this river down to where the Kan-chou-Hsi-ning route meets it. But the Chinese escort and pony-men refused to enter the Ta-t'ung valley from fear of meeting Tangut robbers, and Lāl Singh was reluctantly obliged to return to the camp which still retained me in my helpless condition. The rest of our programme, however, he completed successfully by surveying the range which divides the easternmost headwaters of the Kan-chou river from the Ta-t'ung-ho, and by then descending along its northern spur which forms the watershed between Kan-chou and Liang-chou.<sup>47</sup>

By the second week of August Lāl Singh met me at Kan-chou whither I had been carried in a litter, and then set out promptly westwards for fresh work in the Richthofen Range. He there surveyed an important and previously unexplored portion of this range which with its glaciers and perpetual snows feeds the sources of the Li-yüan-ho, the largest tributary of the Kan-chou river.<sup>48</sup> Crossing to the Po-nan-ho drainage area and then moving northwards, he rejoined me by August 26 at Hsiang-p'u. Though still severely feeling the strain to my leg, I had managed to reach this place on horseback by the right bank of the Kan-chou river, thereby completing the survey of its middle course.<sup>49</sup>

After regaining Mao-mei where I found Muhammad Yaküb duly arrived with the camels from the Etsin-gol side, we commenced on September 2, 1914, the long journey which carried us right across the great desert area occupied by the Pei-shan ranges, where its width is greatest, in the direction from south-east to north-west. The routes we followed for close on 500 miles had never been surveyed, and only at one point, the wells of Ming-shui, did we touch ground previously approached by Russian explorers. The difficulties met in crossing these wastes, with crumbling hill ranges and desolate valleys between them, were much increased by the fact that only a single small Mongol camp was encountered, and that the scant local knowledge of our two Chinese 'guides' completely gave out after less than the first half of the

<sup>44</sup> See Sheet No. 46. B. 3.

<sup>45</sup> See Sheet No. 46. A. 4, B. 4, 5, C. 4, 5.

<sup>46</sup> See Sheets Nos. 43. C. 3, D. 3, 4; 46. A. 4.

<sup>47</sup> See Sheet No. 46. C. 3-5, D. 4, 5.

<sup>48</sup> See Sheets Nos. 43. D. 2, 3; 46. A. 3.

<sup>49</sup> See Sheet No. 43. D. 1, 2.