

PETR PETROVICH  
SEMENOV

Travels in the Tian'-Shan'  
1856-1857

Edited by COLIN THOMAS

HAKLUYT



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PETR PETROVICH SEMENOV  
TRAVELS IN THE TIAN'-SHAN'  
1856-1857

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PETR PETROVICH SEMENOV

Travels in the 'Tian'-Shan'  
1856–1857

Edited and annotated by  
COLIN THOMAS

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and MARCUS WHEELER

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## INTRODUCTION

Political-administrative developments anywhere in the world have always been inseparable from the cultural contexts within which they are shaped. Throughout its emergence a distinctive feature of the Russian state has been its intermediate stance between characteristics which were sharply defined in peninsular and maritime Europe to the West and those more vividly portrayed in the immense land-mass of Asia. Such juxtapositions were – and still are – clearly evident as transitions in geological history, physical structure, climate and vegetation distributions from the Atlantic fringe to the remote land-locked core of the continental interior.<sup>1</sup> Culturally, too, contrasts have frequently been identified in the realms of anthropology, languages, religions, and economic systems, where Western and oriental polarities have been seen to merge in Russia itself.<sup>2</sup>

A dynamic mechanism of exchange over many centuries has been the reciprocal mobility of populations whose respective heartlands have been situated in either core. While physical, social and technological conditions remained powerful constraints on personal movement, migration as such was confined to small numbers of wealthy, adventurous, fortunate or desperate individuals, urged on by diverse motives to reach distant places, and often lacking specific intended destinations. Gradually, accumulated knowledge of localities beyond their narrowly circumscribed routine experience inevitably prompted greater numbers of people to seek improved livelihoods further afield, a process that was often actively encouraged by the state in its desire to occupy newly discovered lands, to exploit natural resources, to ease internal tensions, to safeguard defence, or to enhance international control or status by establishing colonial outposts. Intensified pressure on food supplies, greater economic complexity and the need to maintain regular contact with formerly remote regions, facilitated by an augmented transport capacity to overcome the hardships of extended travel, subsequently served to enlarge the volume of human movement. The historian V. O. Kliuchevskii, indeed, has asserted that 'The history of Russia is the history of a country which was being colonized'.<sup>3</sup> Given the scale of initial environmental and developmental contrasts between widely separated communities, it is hardly

<sup>1</sup> Berg, *Natural Regions*, *passim*.

<sup>2</sup> Hellmann, *Handbuch der Geschichte Russlands*.

<sup>3</sup> Kliuchevskii, *Sochineniia*, I, p. 31.

surprising that, apart from periodic natural catastrophes which provoked mass migration, a crescendo in communication, in the broadest sense of the term, intermittently resulted in rivalries or open conflicts over particular territories and linkages.

When reduced to specific historical events, interaction between the two continents has not always bequeathed unqualified beneficial results for the intervening lands over which the drama has been performed. Several scholars have argued that the thirteenth-century Mongol invasions which contributed to the collapse of the Kievan state left profound psychological scars, to say nothing of long-lasting material consequences through the destruction of settlements, decimation or enslavement of their populations, and the humiliation of having to pay tribute to Muslim khans within the boundaries of Europe.<sup>1</sup> Among members of surviving generations, enduring fears sometimes crystallized into endemic antipathy towards Asiatic peoples and their cultures, alleviated only partially by historic victories such as the Russian recapture of the Tatar nucleus of Kazan' in the mid-sixteenth century.

More recent experience of the ravages of the Napoleonic armies, despite their ultimate expulsion, and defeat at the hands of Western forces in the Crimean War left even more fresh, vivid and bitter memories in Russian minds, together with a belief that recovery lay in reversing those calamities and equalling, even emulating, foreign achievements by borrowing technological innovations from abroad and adopting Western models of thought, practice and behaviour.

If the contemporary external perception of their country as the raw and ragged edge of European civilization was acknowledged at all by the Russian people, it was with a mixture of pride and resentment. The Russian Orthodox Church, inextricably linked to the state, promoted and gloried in the image of itself as the 'third Rome', and through its history of resistance to Muslim onslaughts came to take on the mantle of Europe's eastern Christian bulwark, ultimately creating a self-imposed mission to bring Western cultural standards to Asia, if necessary by force. Combinations of military adversity and success may have fostered a periodic sense of national identity, yet among intellectuals touched by the Enlightenment it sat uneasily alongside a milieu in which many of the nobility habitually spoke French and cared little for the well-being of their fellow-Russian serfs or servants. In the middle of the nineteenth century such a dichotomy was reflected in an ideological debate between the 'Westerners' and Slavophiles in Russia.<sup>2</sup>

Admirers of Peter the Great<sup>3</sup> and his legacy welcomed convergence between Russian and West European ways of life in all their manifestations, not least the

<sup>1</sup> Halperin, *Russia and the Golden Horde*.

<sup>2</sup> Walicki, *History of Russian Thought*, pp. 92–114; Christoff, *Third Heart*, *passim*.

<sup>3</sup> Riasanovsky, *Image of Peter the Great*, pp. 3–85.

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attempt to give Slavs improved material standards by adopting innovative methods in the economy and government, by re-shaping relationships between social groups, by spreading knowledge and skills through education and training, in short by pulling Russia free from its medieval torpor, superstition and backwardness. To traditionalists, on the contrary, Russia's decline could be traced to that same flirting with Western Enlightenment, involving a neglect of spiritual values, as enshrined in religious Orthodoxy, and of the cohesive purity of idealized rural peasant communities, established on the basis of mutual self-respect and consensus. The insidious presence of rationalist ideas and any concession to institutions that might increase their influence in Russia was anathema to the Slavophiles and their sympathizers.

Politically, the Decembrist uprising in 1825,<sup>1</sup> the Polish revolt in 1831, and the series of revolutions in Europe in 1848 all highlighted the authoritarian tsarist government's need, at least by its own logic, to control very firmly any potential sources of outright sedition, dissent, or even advocacy of reform, lest they should acquire an impetuous momentum that could sweep aside the existing order. After exposure of the secret organization of the Petrashevtsi in 1849,<sup>2</sup> by reason of their awareness of and predisposition towards foreign philosophical literature, gatherings of intellectuals were inherently suspect.<sup>3</sup> Whereas in the past destructive rebellions had been raised by illiterate peasants, disaffection had now been discovered among well-educated army officers, university students, civil servants, landowners, and even the nobility. However stringently enforced, internal censorship and restrictions on personal travel abroad since the Napoleonic era proved to be ineffective in preventing the spread of foreign philosophies among those capable of reading English, French or German pamphlets, journals or books.

Personal and collective examples of that dependency on imported skills and ideas stood at the heart of scientific and intellectual life in the universities, the Russian Academy of Sciences and the Russian Geographical Society,<sup>4</sup> each of which revolved around eminent articulate individuals whose ethnic origins were

<sup>1</sup> Raeff, *The Decembrist Movement*.

<sup>2</sup> Seddon, *The Petrashevtsy*.

<sup>3</sup> Squire, *The Third Department*.

<sup>4</sup> The Russian Geographical Society was founded on 6 August 1845, under the leadership of Admiral F. P. Litke, Academician K. M. Baer, V. Ia. Struve, G. P. Gel'mersen, Admiral Baron F. P. Wrangel, I. F. Kruzenstern, Count F. F. Berg, K. I. Arsen'ev, P. I. Koppen, V. I. Dal', A. I. Levshin, Count M. N. Murav'ev, Prince V. F. Odoevskii, Count V. A. Perovskii, P. I. Rikord, M. P. Vronchenko, and P. Ia. Chikhachev, with Grand Duke Konstantin Nikolaevich as its President. On 28 December, 1849, it received the title 'Imperial'. Like comparable societies established elsewhere in Europe in this period, its initial objectives were to present the results of recent exploration and discovery, particularly as they impinged on their respective countries' political and economic interests. Semenov published a review of the Society's first half-century as *Istoriia poluvekovoi deiatel'nosti Imperatorskogo Russkogo geograficheskogo obshchestva, 1845-1895*, St Petersburg, 1896. See also Berg, *Vsesoiuznoe geograficheskoe obshchestvo*, 1946.

by no means exclusively Russian. In the latter institution Baltic Germans in particular were highly visible from the time of its foundation in August 1845, but their positions soon became challenged by a group of young men, trained in the archaic Russian tradition yet not necessarily accepting all its precepts. Above all, the discovery and application of scientific laws,<sup>1</sup> which seemed to symbolize the Age of Enlightenment in the West, caught the imagination of progressively-minded young people as the means whereby Russia could be modernized.

\* \* \*

Petr Petrovich Semenov was born in January 1827 into a minor gentry family in Riazan' province, 240 kilometres south-east of Moscow, in a region where his ancestors had fought against the Tatars. His father had followed the family tradition of serving in the army, participating in the battles against Napoleon at Borodino and Kulm (Chelm), but had been captured and taken as a prisoner to France, escaping in time to enjoy the allies' triumphal entry into Paris at the end of March 1814. After her husband died of typhoid in 1832, Petr's sophisticated but protective mother was increasingly afflicted by depression and psychological disturbances, with the result that, with his elder brother Nikolai and sister Natasha, his upbringing leaned heavily on grandparents, other relatives, servants and foreign tutors, and on the children's own inner self-reliance.<sup>2</sup>

In later life three beneficial outcomes may be attributed to this formative period. Firstly, like several of their more famous contemporaries, all three children acquired sympathetic insights into the everyday life of the villagers and servants on their own and neighbouring estates on the margins of the steppe. Secondly, no doubt as a private escape from the distress imposed by his mother's illness, Petr became absorbed in his own education, reading voraciously in English, French, German and Russian – history, romantic poetry, and novels. Thirdly, the eventual, if somewhat fortuitous, recommendation by Semenov's pedagogue uncle of Danil Ivanovich Kreim as the boy's tutor proved inspired. Kreim had studied botany under J. F. Erhardt, a pupil of Linnaeus, at the University of Göttingen, which Alexander von Humboldt<sup>3</sup> had also briefly attended. Under Kreim's guidance the teenager's knowledge of German deepened, but more relevant from a scholastic viewpoint was the transformation of a childhood interest in plants into a systematic understanding of taxonomy and ecology.

After six years' tuition at home, in 1841 Semenov was enrolled at the School

<sup>1</sup> Vernadsky, 'Rise of Science in Russia', pp. 37–52.

<sup>2</sup> Semenov, *Detstvo i iunost'*, ch. 2 and 3, Lincoln, *Semenov-Tian-Shanskii*, pp. 3–7; Thomas, 'Pëtr Petrovich Semenov-Tian-Shanskii'.

<sup>3</sup> Botting, *Humboldt*, p. 16; Kellner, *Alexander von Humboldt*, pp. 10–15. In his own *Memoirs* Alexander Herzen comments on the strong Göttingen contingent among Germans at Moscow University (pp. 138–9).

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for Guards Ensigns and Cavalry Cadets in Petersburg, while Nikolai attended the élite Tsarskoe Selo Lycée, and Natasha had been placed at the Ekaterininskii Institute. Petr demonstrated that he was a diligent pupil and absorbed without relish the stern military discipline which prevailed in the school. However, he rejected any notion of an army career and in the autumn of 1845 entered the university's science faculty where he was taught by the most eminent scholars of the day.<sup>1</sup>

Undoubtedly conscious of his father's liberalism, as a student in Petersburg Semenov shared an apartment on Vasil'evskii Island with his brother, then a junior civil servant in the Ministry of Justice, and the latter's radical school-friend N. Ia. Danilevskii.<sup>2</sup> From them he acquired divergent insights into the idleness, unending tedium and crushing futility of a bureaucratic career, and determined that his own talents and energy would find alternative means of serving the state and its people. Together Semenov and Danilevskii conceived of a plan to investigate the soils and vegetation of their native black-earth region, the project being sponsored by the Free Economic Society.<sup>3</sup> Soon after setting out they were detained near Tula on the justified suspicion of being linked with Petrashevskii's secret circles.<sup>4</sup> Danilevskii was arrested and later sentenced to administrative exile, but Semenov was released and returned to Petersburg to continue his academic work. Another friend caught up in this purge was the writer Fedor Dostoevskii, whom Semenov later encountered in Omsk.

Having joined the Geographical Society in 1849, Semenov's organizational abilities and academic interests in natural history found outlets with his appointment as librarian and secretary of the Society's Physical Geography Section, while in 1851 he was awarded a master's degree for a thesis on the flora of the Don valley in relation to the vegetation of European Russia. By that time the Society had already embarked upon a project to publish a translation of those

<sup>1</sup> Semenov, *Detstvo i iunost'*, pp. 173–6.

<sup>2</sup> MacMaster, *Danilevsky*, *passim*.

<sup>3</sup> The Vol'noe ekonomicheskoe obshchestvo, the oldest learned society in Russia, was founded in 1765 by Catherine II. Its primary emphasis was on accumulating knowledge of Russia's raw materials in relation to the distribution of the population, and in its early phase it was preoccupied with matters of agricultural development and housing, drawing on technological innovations from western Europe. During the nineteenth century the Society's research was essentially geographical in orientation, taking the form of financing field-work into exploration of the country's natural resources. In 1876 an investigation of the black-earth as a spatial and productive element in the rural economy led to V. V. Dokuchaev's famous monograph, *Russkii chernozem*, which made a fundamental contribution to world soil science. In addition there were detailed systematic and regional analyses of internal trade in grain and food prices. Other technical studies concerned themselves with such issues as livestock diseases, bee-keeping, and fish-breeding, or the distribution and productivity of specific crops. The results of these initiatives were disseminated through the Society's *Trudy* and *Ekonomicheskie zapiski*, published at varying intervals. For most of the first hundred years of its existence the Society also published German editions of its economic and scientific works. Among its leading figures were A. N. Beketov, K. D. Kavelin and N. S. Mordvinov.

<sup>4</sup> Semenov, *Detstvo i iunost'*, pp. 194–211.

parts of Carl Ritter's *Die Erdkunde von Asien* (1817–18) which related to Russia and adjacent territories, a task that was entrusted to Semenov.<sup>1</sup>

Personal misfortune, however, intervened in a double-edged way late in 1852 when his wife, Vera Alexandrovna Chulkova, whom he had married the previous year, died soon after the birth of their son Dmitrii, and Semenov himself contracted typhoid. Advised to go abroad to recover his health, early in 1853 he chose to travel to Berlin, where he attended lectures at the university and became acquainted with Carl Ritter and Alexander von Humboldt, acknowledged to be the father-figures of modern scientific geography.<sup>2</sup>

Almost twenty-five years earlier Tsar Nicholas I had authorized an invitation to Humboldt, enabling him to conduct research into the mineral ores of the Ural mountains, from where he had journeyed as far as Barnaul and the Chinese border. During their discussions in Berlin Humboldt encouraged Semenov to visit Central Asia in order to verify his own speculations that its mountains were volcanic and that glaciers existed there. Meanwhile, university vacations provided opportunities for the eager and vigorous young man to go on walking tours in southern Germany and Switzerland, sometimes in the company of V. A. Miljutin, to familiarize himself with alpine environments. In 1854 he was drawn further south to Italy where he witnessed eruptions of Vesuvius, which he climbed seventeen times to acquire a closer understanding of its phenomena.

Revitalized psychologically and better equipped intellectually to undertake field studies in quite new settings, Semenov returned to St. Petersburg and persuaded the Geographical Society to endorse his proposed travels to the Tian'-Shan'. Previous explorations of Siberia and Central Asia had assumed the aura of intrepid pioneering treks through *terrae incognitae*.<sup>3</sup> The exploits of Ermak<sup>4</sup> and Dezhnev<sup>5</sup> were as well-known as those of Vasco da Gama and Columbus, but not until the Academy's expedition of 1768–74 had well-defined scientific objectives been declared in advance; thereafter, pursuit of particular knowledge in specific places underpinned Russian journeys of geographical discovery.<sup>6</sup>

From a political aspect, too, in 1856 Semenov's attempt to advance the frontiers of knowledge of Central Asia was well-timed. Although the state bureaucracy remained extremely cautious in diplomatic matters, practical

<sup>1</sup> The original title of Karl Ritter's 19-volume unfinished work was *Die Erdkunde im Verhältniss zur Natur und zur Geschichte des Menschen*, and it was intended to be a global survey. Those parts relating to Asia were translated into Russian in nine volumes published between 1856 and 1895 and are generally known under the title of *Zemlevedenie Azii Karla Rittera*. Sukhova, *Karl Ritter*, pp. 194–5; Kozlov and Kozlova, *Semenov-Tian-Shanskii*, pp. 27–8, 237–43.

<sup>2</sup> Dickinson, *Makers of Modern Geography*, pp. 22–48.

<sup>3</sup> Efimov, *Atlas geograficheskikh otkrytii*, plates 26–51.

<sup>4</sup> Armstrong, *Yermak's Campaign*, pp. 1–13 and 18–29.

<sup>5</sup> Fisher, *Voyage of Semen Dezhnev*, pp. 1–22.

<sup>6</sup> Gerasimov, *Short History of Geographical Science*, pp. 36–53; Lebedev, 'Research in the History of Geographical Knowledge', pp. 53–60.

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considerations had brought about progress in Russian influence in the so-called Kirgiz steppe in the first half of the nineteenth century. Trade with China along ancient caravan routes through Turkestan had revealed some of the riches of the orient and an urban demand had been established for tea, silks, precious stones and other luxury items. The safety of Russian and other merchants using these routes was, nevertheless, far from guaranteed. In response, from time to time successive governor-generals of Western Siberia had mounted retaliatory expeditions against the marauding nomads, and on a more permanent basis created a series of defensive lines of forts, manned at fairly regular intervals by small garrisons of Cossacks as a means of offering some measure of protection to settlers and travellers.

After the 'gathering of the Russian lands' and consolidation of tsarist rule in Moscow in the fifteenth and sixteenth centuries, the winning of the Volga frontier against the Tatars brought into reality a distinct linear demarcation between the European and Asiatic protagonists. Nevertheless, its cartographic simplicity was misleading, for behind that line the problems of the Crimean khanate and the Kuban-North Caucasus districts remained to be resolved. The former ultimately succumbed to the campaigns of Potemkin during the reign of Catherine II,<sup>1</sup> but pacification of the Kalmyk steppe and the north Caucasus<sup>2</sup> dragged on into the nineteenth century and was witnessed by, among others, Pushkin, Lermontov and Tolstoi. Meanwhile, by 1740 across the Caspian the Orenburg line of fortifications had been laid out from the Ural (Iaik) river to cut the middle Tobol' and Ishim and to meet the Irtysh at Omsk, then extending upstream to Semipalatinsk and Ust'-Kamenogorsk by 1754.<sup>3</sup>

Relations between Russian Cossacks, settlers and merchants in southern Siberia and the Kazakhs of the steppes were frequently tense, when not openly hostile, over recurrent raids and attacks on caravans en route to or from China, Afghanistan and India. Until the accession of Nicholas I in 1825, however, the border itself had virtually stagnated in its mid-eighteenth century position as none of the Russian ministries wished to commit scarce financial resources or personnel on expansionist policies of uncertain outcome in that area while the irritating problem of Turkey and the Caucasus remained to be settled. The catalyst to renewed offensive action against the nomads appears to have been the appointment of cavalry general V. A. Perovskii as military governor of Orenburg in 1833. Almost exactly a century earlier, I. I. Kirilov had conceived a plan to establish an advance base on the Aral Sea in order to open it to navigation and to offer protection to merchants being harrassed by raiding bandits from Khiva,

<sup>1</sup> Duran, 'Catherine II, Potemkin, and Colonization Policy', pp. 23–36; Fisher, A. W., *Russian Annexation, passim*.

<sup>2</sup> Atkin, 'Russian Expansion', pp. 139–187.

<sup>3</sup> Donnelly, 'Mobile Steppe Frontier', pp. 189–207; idem, *Russian Conquest, passim*.



Bukhara and Kokand. In November 1839 Perovskii mounted a massive campaign to implement that scheme but was forced to withdraw when unexpectedly severe winter weather set in.<sup>1</sup> Nevertheless, during the 1840s tentative moves were made to create more southerly forts in the territories of the Kazakh and Kirgiz hordes and a Cossack line of outposts was established east of Lake Balkhash from Semipalatinsk through Aiaguz and Kopal to Fort Verhoe (Alma-Ata, now Almaty) by 1854. The Russian grip on the desert peoples of Central Asia had begun to tighten.

\* \* \*

On his expedition in 1856, beyond the Urals, that almost imperceptible, though crudely signposted, border between Europe and Asia, Semenov's very mode of travel to the summits of the 'Tian'-Shan' promoted careful accumulation of material evidence concerning the environments through which he passed. The greater part of the journey was accomplished by post-chaise, *tarantas* or on horseback, but in reality traverses from one Cossack *stanitsa*, post-station or bivouac to another were often made at little more than walking pace to enable him to collect plants and rock specimens, while halts for rest or meals provided opportunities to take meteorological and hypsometric measurements. Such daily intimate contact with the land beneath his feet yielded a treasury of plants, subsequently classified by botanists such as Regel, Bunge and Herder at the Academy of Sciences and the Petersburg Botanical Gardens, and among which were found to be new species to which Semenov's name was given.

Raising his perspective from the intensely particular to the general, Semenov took equal pleasure in offering broader outlines of relationships and contrasts in nature. Two examples are particularly significant. Along an almost literal horizontal plane, during his travels over the west Siberian lowlands from Ekaterinburg to the Altai mountains, he distinguished not only a gradual transition in plant communities from European to Asiatic forms, but also identified typological variations in the steppe as such, an ecosystem with which he had previously considered himself thoroughly knowledgeable from researches around his home in Riazan' and Tambov. Whereas in the Sarmatian steppe of southern Russia, aridity was seen as the fundamental characteristic of the plains, in Baraba the surface was liberally dotted with lakes, many of which contained fresh, rather than saline, water, features which caused him to ponder both the diversity of ecotypes and human understanding of them. Elsewhere, the vertical dimension of natural systems impressed itself upon him in the Alatau far more vividly than it appears to have done during his tours in the European Alps, possibly because of the simpler west-east linear orientation of the mountain ranges. On the basis of

<sup>1</sup> Morgan, *Anglo-Russian Rivalry*, pp. 38–50.

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prolonged observation of the altitudinal succession in flora and adaptations to it on the part of indigenous and immigrant communities, he postulated the existence of five ecological zones, each offering different potential from the point of view of prospective Russian colonists. His classification of the area into steppe, wooded foothill valleys, intermediate forested slopes, alpine meadow and high mountain was no descriptive subdivision made merely for the sake of textbook convenience. On the contrary, to each zone he assigned what he believed to be its long-term economic value to either native or settler. Moreover, it is abundantly clear that he envisaged their eventual occupation by Russians as a harmonious pattern in which both cultures would flourish alongside each other and mutually benefit. The Kirgiz nomads, he argued, would always need the summer grazings in the uplands as well as the open steppe margins in winter, whereas for irrigated tillage the primary requirement for immigrants would be a reliable supply of water. Ultimately, that source lay in the partial melting of remote glaciers in spring and summer, brought down by flooding rivers and carried beyond their natural channels by artificial ditches. The middle zone of hills, dissected by narrow gorges, contained extensive stands of timber for settlers, but for the Kirgiz constituted only a transitional area through which pastoralists' flocks needed to climb to reach their alpine meadows. Such insights were clearly intended to represent frameworks of advice to individual settlers and state officials responsible for migration schemes, and were additionally motivated by Semenov's explicit wish to advance the cause of academic geography in the service of the Russian people.

The issue of mountain-steppe-desert integration, already fully appreciated in practical terms by Kazakh and Kirgiz pastoralists, became linked with the problem of seasonal water supply to terrains which might possibly be amenable to irrigated cultivation, and was interrelated in Semenov's mind with theoretical and empirical questions of the reservoirs of moisture locked up in the Tian'-Shan' glaciers and the height of the snow-line in Central Asia. On the subject of perpetual snows he made several observations in the Alatau and Tian'-Shan' ranges in the months of June and July 1857, from which he concluded that here perpetual snows were present above about 3,370 metres along the 41st-42nd parallel of latitude. Evidence from Elbrus and Kazbek in the Caucasus put the average altitude of the snow-line at 3,080 metres, whereas in the Pyrenees it lay about 2,550 metres, suggesting the existence of a gradation from low levels on the margins of Atlantic Europe to higher ones in the heart of Asia. To Semenov such a generalization could not have been explained simply by differences in the quantity of atmospheric moisture available along the same line of latitude, but might equally result from the sheer scale of the altitude in the Himalayas and Central Asia and from their great distance from oceanic influences, operating together to produce an extremely dry climate, which was nevertheless capable of exhibiting sharp and sudden local microclimatic variations. He personally experienced

snowfalls in June on mountain passes at 3,000 metres and, like Lady Macartney<sup>1</sup> half a century later, was horrified to come upon the frozen corpses of humans and animals caught by unexpected storms.

The concept of a much longer span of climatic change was realized during Semenov's studies of the Tian'-Shan' glaciers themselves, together with the morphology and direction of river courses leading from the high ranges to the plains, and from deposits around the shores of Lake Issyk-Kul'.<sup>2</sup> The composition and position of moraines hinted at glacier movements, and therefore alternating periods of greater or lesser precipitation, and of higher or lower average temperatures in the past. When rates of ice-melting increased for decades or centuries, so did the volume and velocity of glacier-fed streams. In turn, the quantity of rocky material eroded from valleys and transported by rivers to lower altitudes was augmented, to be deposited far beyond the mountains as gravel or sand terraces. An integral element in such an overview was the recognition of past fluctuations in the levels of Central Asian lakes – and, indeed, of the Aral and Caspian Seas – with all the implications which that notion held for the orientation of river drainage systems in the whole area. Humboldt and others had believed that the river Chu flowed from Issyk-Kul', but Semenov demonstrated that, whatever might have been the situation in the remote past, the lake had no outlet and that the river had been captured a short distance from the modern lake's shores and diverted in the opposite direction.

Although one of Semenov's general purposes had been to dispel earlier reliance on myths, legends and imprecise travellers' tales as sources of geographical information, his preference for objective scientific observation did not preclude assimilation and use of local knowledge when it was appropriate. While not intimately acquainted with Central Asian cultures and languages in any scholarly sense, he understood that the success of his enterprise and his personal survival could depend on those who did possess such skills, and he made every possible use of Cossacks as interpreters in negotiations and conversations with Kirgiz guides and nomadic pastoralists.

Similarly, despite a preoccupation with acquiring data on the physical geography of what later became Russian Turkestan, he certainly did not neglect collection of cultural artefacts and the recording of details of the way of life of its indigenous populations. In both of those processes he resorted regularly to the artistic expertise of Pavel Kosharov, variously referred to as 'my dear friend', 'my faithful fellow-traveller' or 'my inseparable companion'. Local names of places and phenomena were noted and interpreted; dwellings, utensils, weapons, dress, manners and customs, all found space in his diaries and among Kosharov's landscape sketches. The ethnographic content of the journals, in fact, should not be

<sup>1</sup> Macartney, *An English Lady*, p. 222.

<sup>2</sup> Semenov, 'Narrative of an Exploring Expedition', p. 331.

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neglected in favour of the sheer mass of botanical material or topographical description since it offers vivid first-hand insights into the ways of life of Kirgiz clans immediately before their large-scale contact with Russian colonists. In his observations of either their internecine warfare or their finely balanced customary solutions to social problems, Semenov was always conscious of the contemporary internal coherence of Kirgiz culture, while simultaneously eager to identify parallels with historical sources of conflict between nomads and sedentary Russian populations and anxious to draw the steppe peoples closer to European standards of behaviour, if only by analogy or paternalistic example.

Nevertheless, his approach to achievement of his goals was not invariably aloof from a strand of devious dexterity, a trait perhaps encouraged by the political milieu in which he was obliged to operate. From his own account we know that, even before he embarked on his odyssey, Semenov had no intention of confining himself to his formally declared aims. More than once he wrote that it was his ambition to reach the Tian'-Shan' 'at whatever cost', and long after the event he confided that in his discussions in Omsk with Governor-general Gasfort of Western Siberia he deliberately concealed his ultimate destination, knowing that any official request to visit a sensitive and turbulent frontier district would have been refused, either by Gasfort or the conservative Ministry of Foreign Affairs in Petersburg. After all, only six years earlier during his fieldwork in the Don steppe, he had narrowly escaped Danilevskii's fate of arrest and imprisonment in the aftermath of the Petrashevskii affair, and in Semipalatinsk he renewed his acquaintance with Dostoevskii, who painted a chilling picture of life in enforced exile. Experience had taught Semenov to recognize the nature of boundaries and when not to transgress them. Luck ran in his favour and he was able to rely on the sound judgement of the Cossack colonels Khomentovskii and Peremyshl'skii at Vernyi to accept his assurances that he would not be the cause of any political or military embarrassment. Semenov's childhood longing for adventure had always been tinged with caution and his account of various dealings with the Kirgiz is as convincing a display of diplomacy as it is of personal courage.

Experience of living in settled communities on the plains of European Russia had instilled in their inhabitants almost a sense of universality, rather than of uniqueness, about their physical environment, the boundless unimpeded monotony of the steppes expressed by Chekhov. Semenov admits that until he went to Western Europe he had no real conception of what mountains were like. Historically, too, to the steppe-dweller the languid use of waterways in long-distance travelling between towns was accepted as being slower but often more pleasant at any season than tedious uncomfortable coach journeys along unsurfaced roads that varied in quality between mud and sand, with their proverbial delays incurred by shortages of horses, spent in the company of surly coachmen and rapacious inn-keepers. From his excursions in the Alps in 1853-54 Semenov

had realized that the closer horizons of high mountain terrain channelled movement through narrower courses in well-defined directions. His treks over the Furka, Grimsel and St Bernard Passes in Switzerland had prepared him somewhat for the exertions and constraints which he faced in the Tian'-Shan'. As a geographer encountering nomadic pastoralists and merchant caravans, he also came to appreciate the immense significance of the mountain passes in facilitating or limiting contact between places and people at various times of the year, to say nothing of the random hazards created by the sudden onset of severe weather at high altitudes, avalanches, earthquakes and ambushes. On several occasions consideration for the safety of his team obliged him to turn back from the attainment of a long-cherished goal. On a different scale, wider awareness of the functions of great routeways in Central Asia enabled him to contemplate the past role of the Dzhungarian Gate, as a corridor into the Caspian-Aral-Balkhash lowlands, through which important folk migrations had occurred over centuries. The strategic value of the Ili valley, already known for its agricultural potential, further tempted him at the end of his visit to travel surreptitiously across the Chinese border to Kul'dzha.

If scepticism may be aroused that an old man's vanity might have coloured a re-interpretation of events that had occurred a generation earlier, it does appear that during its course Semenov's journey did in fact acquire a wider unforeseen meaning in his own mind. At first the narrative is content to blend observation of nature with passing notes on the historic towns along the route. Once in Siberia what may be described as new ethnographic and political elements appear, first by way of appreciation of social and economic contrasts between the free Siberian peasantry and the servile population of European Russia before the 1861 emancipation reforms, and later through critical evaluations of the Russian administration's attitude towards the Ural and Altai mining communities and also to the steppe and its indigenous inhabitants. What emerges, therefore, is a personal development from mere scientist-explorer into astute statesman. At the time he was writing his journal for publication in 1908 Semenov's geographical and public service achievements were so universally acknowledged that there was no need for him to inflate his own contribution to the events of thirty years past. Moreover, changes in strategic and economic policies in Petersburg and the controversial actions of vigorous commanders in the field had already accomplished the annexation of the khanates of Kokand, Khiva and Bukhara, and laid the foundations of mass Russian peasant colonization of the Kazakh and Kirgiz steppes.<sup>1</sup>

Semenov's commitment to those long-term objectives was recognized when in 1888 he was invited to join the inaugural journey of the trans-Caspian railway from Uzun-Ada to Samarkand, and his published impressions<sup>2</sup> reveal more than

<sup>1</sup> MacKenzie, 'Conquest and Administration of Turkestan', pp. 208-34; Becker, 'Russia's Central Asian Empire', pp. 235-56; Morgan, *Anglo-Russian Rivalry*, pp. 86-99 and 118-32; Williams, 'Russian Peasant Settlement', pp. 110-22.

<sup>2</sup> Semenov, 'Turkestan i Zakaspiiskii krai', *passim*.

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his edited expedition notes of his pleasure that Russia had ultimately secured its southern frontier and brought material benefits to the people absorbed within it. His own first journey to Central Asia had taken place at the onset of the railway age in Russia and he did not appear then to be aware of the immense potential which that innovation contained for the increased speed and enlarged volume of overland communication or for economic and political integration in the empire. By the 1880s that expanding transport network had contributed to the military conquest of the khanates and drawn their territories and societies into the European urban-industrial orbit, above all by linking areas of raw material supply, especially cotton fibre, to centres of manufacturing. Almost a century was to pass before the negative consequences of such developments on the region's culture and environment were fully realized.

Simultaneously, experience gained from that first exploration, together with Semenov's unrivalled influence in the Russian Geographical Society, was promoting a series of further scientific expeditions to Tibet, Mongolia and the Russian Far East under P. K. Kozlov, P. A. Kropotkin, I. V. Mushketov, V. A. Obruchev, M. V. Pevtsov, G. N. Potanin, N. M. Przheval'skii, N. A. Severtsov, and the Grum-Grzhimailo brothers. Even at the time some contacts raised tension or resulted in open clashes with the Chinese authorities in those imperial borderlands, constituting one recurring note in the theme of the interaction between science, economic resources, population and political power which intensified during the second half of the nineteenth century.

From an epistemological viewpoint these travels might be ranked quite humbly in terms of their techniques of accumulating basic factual information. Semenov's own equipment seems to have included little more than a barometer (which was smashed before he even reached Central Asia), Celsius thermometers, an hypsometer, and blotting paper with which to preserve plant specimens. Yet this procedural approach was firmly rooted in the belief that academic geography began with the acquisition of primary data, subsequently classified according to recognized taxonomic methods, and made available for future detailed quantitative analysis and interpretation in relation to other elements of the ecosystem. Extension of that knowledge by more information gathering and experiment, and its application in the service of mankind, represented second and third stages in the process, but did not necessarily delay the fourth, namely the transmission of results to fellow researchers, government or an interested public audience by means of publication.<sup>1</sup>

Later generations refined beyond imagination both the technological means of data collection and the organization of research. In the case of Russia and the Soviet Union the Academy of Sciences, in collaboration with the universities, established permanent scientific stations for continuous recording of changes in

<sup>1</sup> Semenov, 'First Ascent of the Tian-Shan', pp. 356-66.

the natural environment, thereby adding to an international understanding of global phenomena. For example, in 1945 the Academy set up the Tian'-Shan' High Mountain Physical Geography station in the valley of the Chon-Kizil-su<sup>1</sup> to investigate complex relationships between the lithosphere, atmosphere, hydrosphere and biosphere in the Issyk-kul' basin. From the 1950s the Kirgiz Academy of Sciences' network of hydro-meteorological stations in the upper Almatinka valley produced evidence of changes in the snowfall and moisture balance in the Zailiiskii Alatau,<sup>2</sup> while glaciological studies in the same broad locality have continued for more than eighty years.<sup>3</sup> Semenov's initial scheme of vertical zonation of landscapes, elaborated by V. V. Dokuchaev and analysed through the Soil Institute named after him, was the subject of a thorough programme conducted in the Sary-Dzhas valley,<sup>4</sup> and the general theme of landscape regionalization has been advanced by Isachenko.<sup>5</sup> In many ways, therefore, the 1856–57 expedition represents a critical step in Russian geography in the transition from replacement of disbelief by elemental discovery to a modern tradition of systematic integrated research which may then be applied for the benefit of mankind.

### Note on the Text

Semenov's papers and Kosharov's drawings are preserved in the Russian Geographical Society's archives in St Petersburg. It was not possible to consult the original journals exhaustively and the text which follows has been translated from the Russian version edited by N. G. Fradkin and published in 1946.<sup>6</sup>

In contrast to the first volume of his *Memoirs (Detstvo i iunost')*, Semenov did not incorporate many notes in this, the second, yet to the non-Russian modern reader, many terms and references require elaboration or comment. Specific technical and cultural terms are incorporated in the Glossary. The few notes appearing in the original have been retained and acknowledged as being attributed to either Fradkin (N. G. F) or L. S. Berg (L. B). In order to avoid disruption of the narrative by embodying in the text – as Semenov often does – long lists of plants collected during his daily excursions, these have now been either assimilated or converted into footnotes and are indicated (Semenov:). All other notes have been compiled by the editor. A very small number of repetitious phrases or sentences which occur in the Fradkin edition have been excised or otherwise absorbed in this translation. Although a well-known authority on the history of

<sup>1</sup> Zabiroy, *Fizicheskaya geografiya Priissykkul'ia*, pp. 3–9.

<sup>2</sup> Sosedov, *Issledovanie*, *passim*.

<sup>3</sup> Zabiroy, *Nekotorye zakonomernosti*, pp. 3–15; Gorbunov, *Vechnaia merzlota Tian'-Shania*, pp. 17–99; Pal'gov, *Zhizn' odnogo lednika*, *passim*.

<sup>4</sup> Bondareva, *Pochvy basseina reki Sary-Dzhaz*, pp. 29–158.

<sup>5</sup> Isachenko, *Landshafty SSSR*, *passim*.

<sup>6</sup> Semenov, *Puteshestvie v Tian'-Shan'*.

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Russian exploration, Fradkin unfortunately allowed numerous typographical and other errors to remain in his published version. Every effort has been made to eliminate these, in particular by checking and, where necessary, correcting botanical names according to Hooker and Jackson's *Index Kewensis* (1895).

The collection of pencil sketches and watercolours by Pavel Kosharov<sup>1</sup> consists of 148 items, which although numbered (as indicated in the translation) are not arranged in chronological order. They are broadly classified according to content in the sense that numbers 1–47 are portraits of named individuals, other Kalmyks or Kirgiz as representative types, Central Asian utensils, weapons, folk costumes, dwellings and animals, whereas numbers 48–148 are depictions of scenery or geological formations. Irrespective of their function as illustrations of Semenov's expedition, all possess considerable artistic merit and ethnographic or geographic value. Kosharov's technical skill was matched by his powers of detailed observation, all combining to create interest in, and a remarkable source of information on, a hitherto unknown area and its inhabitants.

The transliteration system adopted for personal and place names and for Russian terms is that of the Library of Congress. Since the nineteenth century many place names in the former Soviet Union have undergone changes, in recent years sometimes reverting to their original pre-Revolutionary nomenclature. In the case of Almaty (formerly Alma-Ata), the first Russian settlement in 1854 was known as Fort Vernoe, but when it was accorded urban status the name was transmuted to Vernyi: consequently both versions appear in Semenov's memoir in the appropriate chronological context.

All dates in the text are those of the Julian calendar (Old Style).

<sup>1</sup> Arkhiv Geograficheskogo obshchestva, fond 58, opis' 1, del 23.



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## GLOSSARY

- Alpenglühen* (Ger.) – atmospheric effect immediately before sunset when snowy alpine heights in the east are lit by a succession of colours from yellow-orange through rose pink to purple. The reverse sequence appears in the west at sunrise.
- amphibolite – basic igneous rock with abundant hornblende produced during metamorphism.
- arshin*, -y (Russ.) – measure of length equal to 71.1 cm or 28 ins.; one third of a *sazhen*'.
- assignatsiia* (Russ.) – paper money introduced in 1768–69; in 1839 the rate of exchange was fixed at 3.6 rubles in *assignatsii* for one silver ruble.
- ataman* (Russ.) – elected Cossack military commander.
- aul*, -y (Russ.) – settlement cluster (among the nomads in the Caucasus and Central Asia), equivalent to a village among sedentary peoples elsewhere; later became applied to an administrative division in Central Asia.
- airan* – soured, diluted skimmed cow's milk, popular among the Kazakh and Kalmyk peoples as an alternative drink to *kumys*.
- barin* (Russ.) – member of the gentry or nobility.
- bel* | *ok*, -*ki* (Russ.) – local, typically Altai-Saian, name for mountain ranges and summits, covered with snow for the greater part of the year.
- bii* – otherwise *bai*, *bei*, or *beḡ*, a Turkic landowner or elder in Central Asia.
- Brandschiefer* (Ger.) – combustible rock of Silurian age, similar to oil shale.
- breccia* – rock composed of angular fragments mixed with finer material, in contrast to more rounded conglomerate.
- Cabinet – the office administering the Russian Imperial properties.
- chetvert*' (Russ.) – a quarter, a dry measure equivalent to 210 litres.
- commune (Russ. *mir*) – an organ of limited Russian peasant self-government and village land management with various legal and fiscal powers and obligations. At the time of Semenov's expedition it was the subject of lively historical and political debate. See Blum, *Lord and Peasant*, chapter 24, and Male, *Russian Peasant Organization*.
- crinoids – a group of marine animals, fossilized forms of which are particularly strong indicators of sediments of Cretaceous age.
- Cossacks (*kazaki*) – the first Cossack settlements in the Don basin on Russia's southern steppe frontier emerged in the later sixteenth century as relatively

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- free, pioneer agricultural colonies, often augmented by runaway serfs. Simultaneously they acted as the nucleus of a defensive Orthodox Christian force against incursions by the Tatars. Democratic and fiercely independent, Cossacks acquired a reputation for rebellious freebooting in a tenuous relationship with central authority. Later they became assimilated into a more narrowly military organization and function, and by the late nineteenth century formed nearly 150 cavalry regiments in eleven armies, or 'hosts', dispersed from the Black Sea shores, through fortified garrisons in Siberia, to the Far East. See Longworth, *The Cossacks*.
- desiatina*, -y (Russ.) – areal measure, equivalent to 1.09 ha or 2.7 acres.
- diabase – an older geological term referring to medium-grained, basic (alkali-rich) igneous rocks of pre-Tertiary age.
- diorite – a medium to coarse textured intrusive igneous rock, consisting of soda-lime feldspar and hornblende.
- Felsenmeer* (Ger.) – literally 'sea of rocks', coarse angular deposits left by retreating glaciers.
- Firn* (Ger.) – stratified snow deposits, representing an intermediate stage between granulated snow of a snowfield (*nevé*) and glacier ice during which snow becomes more dense and compact under pressure; formerly, *Firn* and *nevé* were used interchangeably.
- gabbro – coarse-grained basic igneous rock.
- gneiss – general term indicating any fairly coarse-grained, crystalline rock with alternate banding of lithological types. All involve an igneous element but their origins are diverse.
- gostinyi dvor* (Russ.) – trading arcade, covered market.
- greywacke (Ger. *Grauwacke*) – an old term for a complex rock in which grains of quartz, feldspar and other minerals are cemented together with siliceous matter.
- Grünstein* (Ger.) – lit. 'greenstone', diabase.
- guberniia* (Russ.) – administrative province or government, originating in 1708. From 1775 there were in Russia 40 *gubernii*, subdivided into *uezdy*.
- halophytes – plants which tolerate considerable amounts of salts in solution and characteristically grow on saline soil.
- hornblende – black or green-black mineral widely found in igneous and metamorphic rocks, derived from basic pyroxene.
- iurta*, -y – circular tent-dwelling of felt, covering a lattice framework, used by steppe nomads.
- khalat* (Russ.) – long smock or dress, typically worn by Oriental women.
- khutor*, -a (Russ.) – isolated compact farm, most typical of the Baltic regions but also of early phases of colonization elsewhere.
- Kirgiz – A Turkic-speaking people, now living on either side of the former Soviet central Asian border with China, but believed to have migrated from the



upper Enisei basin of Siberia in the eighth century. They became displaced by, or absorbed into, the thirteenth-century Mongol empire, and were subsequently pushed eastwards into Chinese Turkestan by the Kalmyks in the seventeenth century, before falling as vassals to the Kokand khanate in the early nineteenth century and being forced to accept Islam more fully. They accepted the status of Russian protectorate in 1868. Their traditional life was dominated by long-distance nomadic pastoralism which made use of summer grazings in the high valleys and plateaus of the central Asian mountains. See Akiner, *Islamic Peoples of the Soviet Union*.

*košoshnik* (Russ.) – traditional head-dress for women.

*kolki* (Russ.) – birch or aspen woods occupying low interfluvial steppe, especially in western Siberia.

*krai* (Russ.) – large Russian territorial unit, usually sparsely settled.

*kumys* (Russ.) – fermented mare's milk.

*kurgan* (Russ.) – tumulus, burial mound.

lidite (chalcedony) – a silica formation often used as a source of semi-precious stones.

*manap* – Turkic clan leader

*marinka* (Russ.) – Schizothorax, fish.

melaphyre – type of basalt, fine-grained igneous rock. See diabase.

mullah – Islamic cleric.

*muzhik* (Russ.) – peasant.

*okrug* (Russ.) – administrative district, approximating to an *uezd*.

*pel'meni* (Russ.) – Siberian meat dumplings.

*poles'e* (Russ.) – areas of wooded marshland found throughout European Russia to the north of the limit of the last glaciation. The classic area is the Pripiat' basin.

porphyry – an older geological term applied to medium-grained intrusive igneous rocks, often formed relatively near the surface, e. g. as sills or dykes.

*pristav* (Russ.) – judicial or police officer having a wide variety of duties.

*pud*, -y (Russ.) – measure of weight, equivalent to 16.38 kg or 36.11 lb.

*sazhen'* (Russ.) – linear measure equal to 2.13 metres.

schist – coarse-grained metamorphosed rock, characterized by varied types of parallel arrangement of its main mineral components.

shaman – a spiritual intermediary with the deities, especially among the peoples of Northern Asia, who uses his supernatural powers to heal.

*solfatara* (Ital.) – volcanic crater, now emitting only sulphurous gases.

*solonchak* (Russ.) – salt-marsh, or saline, widely distributed in the deserts of Central Asia, formed by evaporation from heavily mineralized ground water, leaving crusts of carbonates, chlorides, sulphates, etc., at the surface.

*solontsy* (sing. *solonets*) (Russ.) – salines.

*solianka* (Russ.) – plant of the *Salsola* family; saltwort.

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- sopka*, -i (Russ.) – a conical hill or knoll, especially in eastern Siberia, where the term is often applied to volcanoes in the strict sense, for example in the Kurile Islands and Kamchatka.
- sotnik* (Russ.) – Cossack lieutenant, in charge of a *sotnia* or squadron of a hundred soldiers.
- stanitsa*, -y (Russ.) – a large Cossack village, or the settlement nucleus for several outlying hamlets or farms.
- state peasants – peasants on state land, mostly in Siberia, where there were very few noble landowners with serfs. Though freer than serfs on seigniorial estates, they could be forced by the government to work in the mines or other state enterprises as ‘assigned peasants’. See Blum, *Lord and Peasant*, chapter 16.
- steatite – massive fine-grained rock, composed mainly of talc; similar to soapstone.
- syenite – derived from Syene (Aswan) on the Nile, now applied to coarse even-grained crystalline rocks lacking quartz but rich in alkali feldspars, with a structure typical of plutonic rocks, similar to granites.
- tarantas* (Russ.) – a springless, four-wheeled carriage.
- tarpan* – *Equus gmelini*, a small feral horse of the Eurasian steppes.
- turpan* – *Fuligula fusca* (pochard), a large bird common throughout the northern hemisphere, especially near lakes where it feeds on molluscs and small fish. In Russia they winter near the Black and Caspian Seas.
- troika* (Russ.) – team of three horses harnessed abreast.
- uval*, -y (Russ.) extended elevations, usually below 200 m in altitude, with gentle gradients and lacking clearly defined breaks of slope.
- uezd*, -y (Russ.) – administrative area, the main post-1775 sub-division of a *guberniia*.
- versta* (Russ.) – linear measure equal to 500 *sazheni*, 1.07 km or 0.66 miles.
- volost'*, -i (Russ.) – rural commune or administrative area; after the 1861 reform, a sub-division of an *uezd*.
- zaimka*, -i (Russ.) – originally a squatter holding or isolated arable plot, especially in a forest context, appropriated by continued occupancy and subsequently becoming an independent farmstead.
- zolotnik* (Russ.) – a unit of weight equal to 4.26 g or 0.45 oz.



## CHAPTER I

# From Petersburg to Semipalatinsk

*Conclusion of the Paris Peace. My visit to the country and return. The first measures of Alexander II. Support rendered to me for my travels by the Geographical Society. Journey through Nizhnii—Kazan'—Kungur—Urals and Ekaterinburg. The West Siberian lowlands. Siberian travel and some peculiarities of the local population. The Ishim steppe. The Irtysh and Omsk. Governor-general Gasfort. Potanin and Valikhanov. The Barabinsk steppe and Kainsk. Crossing the Ob' at Berdskoe. Barnaul. Travel to the Altai. Lake Kolyvan'. Zmeinogorsk. The rivers Uba and Ul'ba and the belki surrounding them. Ridersk and Ivanovskii belok. Route to Semipalatinsk.*

By the time of my return to Petersburg in 1855 from my two-year foreign travel, in all sections of the capital's society there was lively speculation as to whether it was expedient to hasten the conclusion of peace, or, on the contrary, to continue the [Crimean] war. The entire industrial and financial world backed the speedy conclusion of peace, but military and patriotic circles favoured continuation of the war. Nevertheless, in government spheres the desire for peace prevailed, and Prince Orlov<sup>1</sup> was sent to the Paris conference.

At the beginning of autumn I went to my place in the country, where I was fortunate enough to find my three-year-old son safe and sound; Ekaterina Mikhailovna Kareeva, the worthy governess of my wife, had brought him up with exceptional love and selflessness.

With the approach of the first signs of spring in 1856 I hastened to return to Petersburg, where I had many things to do. The peace talks in Paris were already coming to an end, but there was no news yet about any kind of reform, although

<sup>1</sup> Prince Aleksei Fedorovich Orlov (1787–1862), son of Count Fedor Grigor'evich Orlov, took part in the Napoleonic campaigns and commanded the regiment that suppressed the Decembrist uprising in 1825, after which he was made a Count. Having served in the Russo-Turkish War (1828–9), he became a diplomat and was Russian envoy in Constantinople, Vienna and Berlin. After the Paris conference he was made a Prince and became President of the State Council. By coincidence, his brother Mikhail (1788–1842), an *aide-de-camp* to Alexander I, belonged to the same society, *Soiuz blagodenstviia*, as Semenov's father, and in the aftermath of the Decembrist revolt was dismissed from army service, partly for his sympathies for the exiled Pushkin.

progressively-minded people among the capital's intelligentsia were profoundly convinced that the most inevitable reform, emancipation of the peasants, would not be long in coming. In the provinces, by contrast, the landed gentry was still very far even from thoughts of the possibility of peasants' emancipation. Of course, even in Petersburg no-one could bring himself to call the forthcoming legislative reform the 'emancipation of the peasants'. And when the first act of the reign of Alexander II was an Imperial command concerning some changes in military uniforms (among other things, red-coloured trousers were introduced into a general's uniform), it gave cause for persons inclined to flippancy to say: 'We were expecting laws, but we only got drawers!'

Certainly, Alexander II's lifelong weakness for uniforms was manifested in such changes. One day, already during the last years of his life, a young officer, later a famous traveller,<sup>1</sup> was presented to him. Alexander II, though looking favourably on the man being presented, who had ordered a new uniform for this occasion from one of the best tailors in Petersburg, could not refrain from comment that some edging on the collar of his uniform was not sewn on correctly, and asked, in a somewhat strict tone of voice, from what tailor he had ordered his uniform. Hearing the name of the famous tailor, the Sovereign said: 'Tell him that he is a fool'.

In the Geographical Society, under the previous vice-president, Murav'ev,<sup>2</sup> I found the secretary in succession to the deceased V. A. Miliutin<sup>3</sup> to be Evgenii

<sup>1</sup> Bronislav Liudvigovich Grombchevskii (1855–1905) served in Turkestan as an infantry officer, taking part in the Alai campaign (1876) and in Samarkand (1878). While administrator of Margelan *uezd*, he studied the Sart and Tadjik languages and in 1885 explored the whole Chinese border from the Tian'-Shan' to Kashgar, a journey of 1,000 *versts* which won him the Geographical Society's silver medal. In 1886 he explored the upper courses of the Syr-dar'ia, Naryn and Susamyr, and also the Fergana and Aleksandrovskaia ranges. As an astronomer at St Petersburg University in 1888 he studied the Pamir and part of the Hindu-Kush, covering over 2,800 *versts* of little-known territory establishing astronomical observation points and barometric height measurements, taking photographs and samples of mineral deposits. For that expedition he was awarded the Society's gold medal. Even greater results came from a third expedition to the Pamir, Hindu-Kush, north-western Tibet and Kashgar in 1889. From 1903 he was Governor of Astrakhan and *ataman* of the Astrakhan Cossacks. When Semenov was writing his *Memuary* in 1908, Grombchevskii was chief administrator of Osh *uezd*, Fergana *oblast'*.

<sup>2</sup> Mikhail Nikolaevich Murav'ev (1796–1866) was linked with the first political secret society, *Soiuz blagodenstviiia*, in 1820 after the revolt of the Semenovskii Guards Regiment, and was arrested. Later he was Vice-governor of Vitebsk and civil Governor of Mogilev, and was active on the army staff against Polish rebels in 1831. Subsequently he became successively Governor of Grodno, Minsk, and then Kursk. A member of the Senate and the Council of State, from 1850 to 1857 he was Vice-President of the Geographical Society, but also remained in the state bureaucracy as President of the Department of Crown Lands (1856) and Minister of State Properties (1857). With the outbreak of the Polish uprising in 1863, he became Governor-general of the six north-western provinces, over-seeing the exile to Siberia of some 5,000 people.

<sup>3</sup> Vladimir Alekseevich Miliutin (1826–55), younger brother of Nikolai and Dmitrii, was educated at Moscow and Petersburg Universities, becoming assistant professor in law at the latter in 1850. From 1848 he was a member of the Geographical Society and worked in its statistics section. In 1852 he became the Society's secretary and edited its *Vestnik*, making it a widely recognized scientific journal. In 1854 and 1855, already gravely ill with cancer, Miliutin met Semenov on several occasions and they travelled together in Germany, Switzerland and Italy, until, increasingly depressed by his

Ivanovich Lamanskii,<sup>1</sup> one of the most talented and outstanding young scholars in the field of economics. Energetically, I threw myself into completing an extensive supplement to the first volume of Ritter's *Asia*<sup>2</sup> and secured keen and active assistance in Vasilii Pavlovich Vasil'ev,<sup>3</sup> the esteemed and best sinologist in Russia, with whom I became very friendly during that time, and who was, indeed, a fine person and a fervent patriot. During the winter of 1855–6 my work, which had begun long since, came to an end. At the same time, too, my translation of the parts of Ritter's *Asia* referring to the Tian'-Shan' and Western Siberia, which called for still more extensive addenda, was completed. It was this excuse I used to fulfil my cherished dream: a journey to Central Asia.

But it would have been a big mistake on my part to give priority to my wish to penetrate the Tian'-Shan', or even to inform anyone about my firm intention to get there. Such a resolve would have met strong opposition on the part of the Ministry of Foreign Affairs, which jealously guarded Asian countries lying beyond Russia's borders [see Fig. 1] against the intrusion of Russian geographical science in the persons of Russian travellers, at a time when Germany, before the eyes of the whole world, was already openly equipping its expedition to Central Asia, sending it via India! That is why, with diplomatic caution, I declared officially before the Geographical Society the necessity, for my supplements to the next volumes of Ritter's *Asia*, to visit those areas which were described in them, namely Altai, the Kirgiz steppe, and so on. In so doing, I requested from the Society only their moral support in the form of open letters, recommendations and so on, and a small subsidy of 1,000 rubles for the purchase of instruments and generally for equipping the expedition, taking upon myself all the expenses of the actual journey. I must do justice to Mikhail Nikolaevich Murav'ev in recording that for his part he regarded my proposal with great sympathy and rendered all possible assistance, while I received active support from the secretary of the Geographical Society, as well as from A. D. Ozerskii,<sup>4</sup> the

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deteriorating health and an ill-fated love affair, he committed suicide. The close friendship between the two men at that time is chronicled in chapter 5 of the first volume of Semenov's *Memuary*. Rather poignantly, one of Miliutin's less well-known writings, in *Souremennik* in the year of his death, was entitled 'Alkiviad' ('Alcibiades'), a nick-name later given by Semenov to an acquaintance in Siberia. See below, Chapter 3, note 1.

<sup>1</sup> Evgenii Ivanovich Lamanskii (1825–1902), public figure and financier.

<sup>2</sup> Semenov had been authorized by the Russian Geographical Society in 1850 to translate into Russian those parts of Carl Ritter's *Erdkunde* relating to Russian territories.

<sup>3</sup> Vasilii Pavlovich Vasil'ev (1818–1900), son of a minor official in Nizhnii Novgorod, studied oriental languages at Kazan' University and went on a Russian spiritual mission to Peking, where he studied Tibetan, Chinese and Sanskrit. He remained there until 1850 when he returned to Kazan' as Professor of Chinese and Manchurian literature. Thereafter, he produced an enormous output of scholarly writings on the geography, history, literature and religions of central and eastern Asia. He became an honorary member of St Petersburg University, and an Academician in 1886.

<sup>4</sup> Alexander Dmitrievich Ozerskii (1813–80) graduated from the Mining Cadet Corps in 1831 and taught there until 1857. As head of the Altai mining district until 1864, he made a particular study of vertical tectonic movements of the Earth's crust. Later he classified numerous ores of Trans-Baikalia

chairman of the Department of Physical Geography, and from members of the Council.

In the spring of 1856 I was already fully prepared for my expedition. I reached Moscow by railway and then travelled by road to Nizhnii,<sup>1</sup> where I bought a durable and spacious *tarantas* of Kazan' workmanship, and went by post-chaise along the Great Siberian Highway.<sup>2</sup>

Half-way between Nizhnii and Kazan' I was already in that country which on German maps of the seventeenth and even of the eighteenth centuries was marked as 'die grosse Tartarei'. To us Russians such a designation of the now fully Russian Volga, and even partly central, provinces might seem strange, but, nevertheless, German geographers had their own reasons for this. It is certain that in the middle of the sixteenth century the ethnic border of Europe and Asia did not coincide at all with the now accepted geographical border between these two parts of the world.<sup>3</sup> If one was to draw a straight line from Kishinev through the Dnieper rapids, Khar'kov, Voronezh, Tambov, and Kazan' to Ekaterinburg, in the age of the discovery of America, the European tribes (Slavs and others) lived only to the north-west of this line, and to the south-east of it there was almost no European population. All that 'Great Tartary' of the European geographers belonged to Asiatic tribes, and only since the time of the great world event, the fall of Kazan',<sup>4</sup> which occurred at the same time as colonization of the New World in the trans-Atlantic west by the European race, began the more or less all-round and consistent European-Russian colonization of Asia, which at first seized the extensive lands of ethnographic Asia in Europe, and then quickly spread throughout all of the sub-Arctic zone to the Pacific Ocean.

Later, in 1897, when after thirty years of persistent requests I managed to carry

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and translated R. Murchison's *Geological Description of European Russia and the Ural Range* (1849), adding new material from Russian sources.

<sup>1</sup> Nizhnii-Novgorod was founded by Prince Iurii Vsevolodovich in 1221 on the site of a Bolgar settlement. Located at the confluence of the rivers Oka and Volga, the city became the main trading centre between the Rus and the Bulgars, while acting as a strategic outpost against the Kazan' Tatars in the later medieval period. Eventually its independent principality fell under those of Vladimir-Suzdal' and Moscow. From 1717 it was the chief town in Kazan' province and for several years after 1825 was the seat of government for the whole of the middle and lower Volga region. Its famous fair dates from at least the middle of the thirteenth century, focusing on the feast of St Makarii (25 July). The fair's duration and volume of trade increased markedly during the seventeenth and eighteenth centuries until it came to occupy virtually a separate city on the left bank of the Oka.

<sup>2</sup> For a later journey along the 'Great Siberian Highway', see Wenyon, *Four Thousand Miles*. Despite its grand title, the highway was not in fact a continuous thoroughfare, but rather a series of overland routes between west-east courses of the main rivers, both being impassable for climatic reasons at different times of the year.

<sup>3</sup> Varying historical interpretations of the border between Europe and Asia are traced by Parker, 'Europe: how far?'. Semenov is not wholly correct in implying that use of the term 'Tataria' was a purely German trait. It also appears, for example, on Anthony Jenkinson's map of 1562 and on Remizov's survey of 1701, where its boundaries are shown in relation to other ethnic territories.

<sup>4</sup> The capture of Kazan', headquarters of the Tatar khanate, by the forces of Ivan IV took place in 1552.

out the first general population census<sup>1</sup> of Russia, I calculated that while colonization from all states of Western Europe combined had yielded ninety million people of European race to the New World since its discovery by Christopher Columbus, Russian colonization, directed towards the east and south-east, had installed no fewer than forty-six million people of European race beyond the borders of ethnographic Asia. I had an opportunity to point out this historical service of Russia at the international Christopher Columbus jubilee celebrations in Genoa in 1892.

On the morning of 15 May 1856, I was already on the right bank of the Volga opposite Kazan'.<sup>2</sup> The queen of Russian rivers was still in full flood at that time. It merged with the wide valley of the Kazanka in a single water basin about ten *versts* wide. The weather was stormy, and in view of the fact that ferrying the heavy *tarantas* was bound to take until the evening, I decided to leave my massive carriage to its own fate, under the guard of the serf servant accompanying me, while I set out in a comparatively light sailing boat with six oarsmen to inspect picturesque Kazan' from its outer, water side. We were sailing amidst foaming waves, flooding us with their spray and smashing further on against a tall and massive grey pyramid, above which arose a barely visible small gilded cross. Erected only in 1823, this was a modest and inelegant monument over the communal grave of the heroes who, by taking Kazan' in 1552, turned the Muscovite realm, which had emerged only comparatively recently from beneath the Asiatic yoke, into one of the great European states. The monument rose above the water like a solitary cliff, but near it on a separate eminence towered the picturesque Silant'ev (Zilantov) Monastery, surrounded by the greenery of trees in spring attire; and further to the right of it stood in splendour the Kazan' Kremlin with its picturesque churches, mosques, historic Sumbekina Tower and Voskresenskii Monastery. I deliberately disembarked in Kazan' a little early in order to see places of interest in the city. By nightfall my *tarantas* had arrived too, and next morning I was already travelling in it along the old Siberian highway. I travelled quickly and without stops both by day and at night, but nevertheless the journey from Kazan' to Ekaterinburg through Kazan', Viatka and Perm' provinces took me eight days and nights. The whole boundless plain, beginning from the Volga

<sup>1</sup> The first all-Russian, and only pre-Soviet, population census was conducted in 1897. An earlier system of poll tax collection on the basis of an enumeration of adult males had been instituted by Peter I's decree of November 1718 which continued until the tenth revision of 1859. Troitskii, *Serf Population*, pp. iii–xx.

<sup>2</sup> Kazan', 1554 km from St Petersburg, was founded in the later twelfth century near where the river Kazanka joins the Volga, the original site being Staraia Kazan'. The present site, dating from the fifteenth century, occupies a hill where a *kremli'* was surrounded by a wall, 1568 metres in length, and having five small towers. When the Tatar khanate was finally extinguished, a bishopric was established, the Cathedral being completed in 1596, and the town's administrative and commercial significance greatly expanded; it was designated a *guberniia* town in 1708. Despite numerous fires and depredations during the Pugachev rebellion, Kazan' retained many of its early architectural monuments. In 1893 it was the eighth largest town in Russia, with 125,889 inhabitants, although the number had decreased since a phase of rapid expansion between the late 1850s and the 1880s.



to Kungur,<sup>1</sup> an *uezd* town in Perm' province, consisted of horizontal strata of sandstone and marls of the Permian system, covered with thick layers of rather monotonous alluvium, exposed only along the river banks. All the way along I came upon extensive well-constructed settlements, almost exclusively of state peasants who worked in the mines, and they surprised me by the good standard of living and prosperity of their inhabitants and by the presence of the main indicator of peasants' wealth – the large number and good quality of horses, and livestock in general. Serfdom, so gravely affecting the mine-working population, in the narrow meaning of the term, did not influence the conditions of peasant life in settlements here, which fully enjoyed the relative freedom of their work. There was no agricultural *corvée* [*barshchina*]. They engaged in cultivation, exclusively for their own needs, only during the busy season of field work, while during the remaining seasons of the year, particularly in winter, and generally during time free from field work, thanks to the significant development of their cattle-rearing, the local peasants received greater benefits from their trade than those in our central black-earth Russia. Although they were not themselves the owners of the mineral resources of the district, and also exploitation of these resources, that is the factory and mine operations, was carried out by an enserfed mining population, the rural peasant population directly or indirectly received benefits from the exploitation of the mines. Not to mention the fact that at working factories and mines the peasants found a good market for their agricultural produce, processed by them in conformity with local needs, they also found earnings by auxiliary work in factory and mining production, such as felling trees, burning charcoal and delivering the produce of the timber trade to the factories and landing stages.<sup>2</sup> All these activities, as well as the carrying trade, which was supported by the immense postal traffic along the Great Siberian Highway, secured all the larger benefits to the local rural population in that they coincided with time free from field work.

Thirty-five years after the emancipation of peasants in Russia, highly-educated scholars from Western Europe, coming for the first time to Russia in 1897 to the Geological Congress, and having formed their notion of the Russian *muzhik* only from the Berlin humorous magazine *Kladderadatsch*, were astonished, while visiting the Urals, by the beauty of the visage and physique, the originality of mind and development of the Urals peasants, in whom they did not

<sup>1</sup> Kungur, 93 km south-west of Perm' and 2,089 km from St Petersburg, was founded in 1647 on land purchased from the Tatars, but changed its site several times. In 1662 it was destroyed by a rebellion of native peoples, but subsequently grew as the region was pacified. The population increased from 5,523 in 1771 to 7,859 in 1832, and to 12,488 by 1892. Around the latter date Kungur had more than 100 works and factories, one-quarter of them being tanneries. Several companies sent goods to China in exchange for tea, and the town hosted three large fairs each year.

<sup>2</sup> Non-industrial activities in the Urals provided employment for thousands of people; according to Lenin (*Development of Capitalism*, pp. 484–8 and 524–35), the labour-intensive nature of the iron industry made it technically backward by west European, and even south Russian, standards.

find the slightest traces of servility or oppression. And there were no such traces even half a century ago, at the time of my travels in 1856–7. At that time the peasants of Viatka and Perm' districts seemed to me to be direct descendants of that strong and healthy Slav tribe, which since olden times from ancient Novgorod the Great strove to move eastwards and easily colonized the lands of Khlynov [Viatka] and Perm' districts as far as the borders of Asia.

Returning to my story, at the first station beyond Kazan', where I had to wait several hours for post-horses, owing to the passage of a certain prince of the rank of general, I had an interesting encounter. It was with a mining engineer, Vasiliï Apollonovich Poletika,<sup>1</sup> a man outstanding in his talents and education. After a few hours in lively exchange of ideas we became so friendly that I invited him to come with me in my *tarantas*, as he did not have a carriage of his own and was travelling by post-chaise. Poletika accepted my offer only on condition that when I should be in Barnaul I would stay at his house.

Only after Kungur, on the way to Ekaterinburg, we at last crossed the whole width of the Urals range. With the joy of a geologist I came first upon an exposure of solid sedimentary rock, elevated and penetrated by crystalline rocks; then exposures of these latter, namely granite and diorite, appeared also; but in relation to the relief of the country, along the latitude of Ekaterinburg the Urals could be crossed almost imperceptibly. The mountains are not picturesque here; the granite rocks are flat and hardly show above the surface on account of the sediments; the vegetation, consisting of coniferous forest, is rather monotonous; and only a signpost inscribed on one side – 'Europe' and on the other side – 'Asia', naively, albeit graphically, represented the artificial border between two continents.<sup>2</sup>

Ekaterinburg<sup>3</sup> exceeded my expectations. I had not thought of finding on the

<sup>1</sup> Vasiliï Apollonovich Poletika (?–1888); a mining engineer by profession, but having spent 25 years in the West Siberian mines administration in the Altai district, he became an industrial entrepreneur and forceful anti-free-trade publicist. In later years he was Vice-president of the Society for the Promotion of Russian Industry and Trade.

<sup>2</sup> The effect of reaching this point, under very different circumstances (though if chance had been less favourable at the time, they might have been the same for Semenov), is recorded in Dostoevskii's account of his transportation to prison in Siberia in January 1850: 'It was a sad moment when we crossed the Urals ... All around us was the snow and storm; it was the frontier of Europe; ahead of us was Siberia and our unknown fate, while all the past lay behind us – it was so depressing that I was moved to tears' (Dostoevskii's letter to his brother, cited in Frank, *Years of Ordeal*, p. 70). This contrasted markedly with his feelings nearly ten years later when he stopped there in high summer on his way back from exile: 'God, at last, had led me to see the promised land – we drank our goodbye to Asia'. Ibid, pp. 290–91.

<sup>3</sup> Ekaterinburg, renamed Sverdlovsk from 1924–91, was founded in 1721 and became the centre of the mines administration with its own mint in 1735. It developed as a provincial town, the Siberian *trakt* having been directed through it in 1763. A century later, it became transformed from a military-mining settlement to a civilian town, with banks, schools, a hospital, theatre, libraries, an observatory, and diverse industrial enterprises, a weekly bazaar and two annual fairs. It had a population of about 43,000 in 1897.

Asiatic side of the Urals such a beautiful city, which, of course, owed its development to the Urals' ore riches.

It is noteworthy that the Urals range, colossal in its extent from north to south (almost 20° of latitude), serves in both physical and economic respects not to separate the two continents between which it passes, but to establish a close and indissoluble link between them.

Neither in relation to climate nor to flora and fauna do the Urals represent a sharp boundary. Their mineral wealth, disposed within a belt, not too wide, mainly along their eastern slopes, creates a very firm knot of mutual relationships between the inhabitants of their European and Asian flanks; it attracts working hands from wide zones of Europe and Asia immediately adjacent to the Urals, and also enlivens and enriches the agricultural population of even wider zones by providing a reliable and profitable market, not only for their produce from tillage but also for their rural products in general to Urals factories and mines.<sup>1</sup>

Having become acquainted, with the help of V. A. Poletika, with all the peculiarities of the mining industry of Ekaterinburg, I left that city on 26 May. For a distance of 330 *versts* the road ran along the river Iset' via Shadrinsk,<sup>2</sup> the last *uezd* town in Perm' province. Mountains, or rather hills, which served as foothills of the Urals, stretched for about another two stations from Ekaterinburg, but further on they now smoothed out, the solid sedimentary rocks disappearing completely under the alluvium: coniferous forests at first began to display an admixture of birch and aspen, and then were displaced by deciduous woods, alternating with extensive meadow areas and peasants' fields. Beyond Shadrinsk, and especially beyond the border of Tobol'sk province, there stretched before me the boundless West Siberian lowland, the most extensive in the Old World, the absolute altitude of which does not exceed 200 metres, and on which, from the last Urals foothills to the first Altai ones, there is not a single stone in the form of solid rock, nor even in the form of boulders, so that this country cannot boast of an abundance of stone building materials.

With curiosity I looked closely at the characteristics of the spring covering of the West Siberian lowland and was soon convinced of the truth of the remark of

<sup>1</sup> The most detailed systematic accounts are by Stepanov, *Ural*, and Aksarin in Kutaf'ev ed., *Rossiiskaia Sovetskaia Respublika*, pp. 541–626.

<sup>2</sup> Founded in 1662, initially as a small fortified *sloboda* on the river Iset', Shadrinsk received urban status in 1712 and was named Malo-arkhangel'sk or Arkhangel'sk, but after a devastating fire in 1733 it reverted to its former rank and name. By 1737 it had re-emerged as a town and, following several administrative changes, was assigned to Perm' *guberniia* in 1796. In 1897 it had a population of 11,686, supported mainly by the produce of the agricultural hinterland which was processed in its breweries, distillery, grain mills and works handling sheepskins. The environs consisted of level, predominantly tree-less steppe, but with over 300 lakes. Only 5% of the total population lived in either of the two towns, the remainder being dispersed in more than 400 villages. One tenth of the population was Bashkir.

Gmelin,<sup>1</sup> the famous author of the first Siberian flora, who as far back as the eighteenth century noted that in fact the characteristic Siberian flora on the Great Siberian tract begins only beyond the Enisei. No sharp change was found from the typical vegetation which in spring covered all of the Slav plain from Silesia to the Urals. Of flowers, which brighten up the extensive meadows of Western Siberia at that time (the end of May), the light violet, fluffy, gracefully drooping heads of anemone, which in our country bear the poetic name of 'sleeping-grass' (*Pulsatilla albana*), the golden flowers of lychnis (*Adonis vernalis*), coming out of the thick bunches of their bright green pinnate leaves; and the dark blue flowers of azure lungwort (*Pulmonaria azurea*), provided colouring to the vegetation cover. Only the substitution of yellow semi-double heads of European *kupal'nitsa* by fiery bright flowers of no less double Asiatic forms of this beautiful plant (*Trollius asiaticus*), which is particularly effective in places where it covers glades with extensive thickets, reminded me that I was amidst the Asiatic plains. I was particularly struck in this vegetation cover by the fact that its most characteristic plants like to live, just like the local agricultural population, a communal life, and with their density add a marvellous brilliant colouring to the wide spaces. The artist Iartsev's paintings, depicting the vegetation cover of Siberia, mainly of the Enisei valley, arranged by me at the Russian-Asiatic department display of the Paris Exhibition of 1900, very graphically conveyed this peculiarity of Siberian flora.

Great beauty is added to the West Siberian plain by its gigantic light-coloured rivers, which are incredibly full in spring. The first of the trans-Ural rivers lying on our way was the 'Tobol', across which we were ferried near the town of Ialutorovsk<sup>2</sup> on 28 May already before sunrise on a light, poetic May night.

Beyond the 'Tobol' we no longer needed to stop at the State post-stations.

<sup>1</sup> Johann Georg Gmelin (1709–55), son of an apothecary and metallurgist who was Professor of Chemistry and Medicine at Tübingen University. Having himself enrolled at the University at 13, in 1727 he defended his doctoral thesis and moved to the St Petersburg Academy of Sciences. In 1731 he was appointed Professor of Chemistry and Natural History, and began a catalogue of the mineralogy collection that was later completed by Lomonosov. The following year, with G. F. Miller and L. Delisle, he organized an Academy expedition to Kamchatka, which was the largest eighteenth-century project of its kind and lasted until 1743. Returning to the Chair of Botany at Tübingen in 1747, Gmelin published a four-volume account of his Siberian travels and a four-volume *Flora Sibirica* (1747–9) which incorporated 1,178 plants, 500 of them new to European science. His work was greatly admired by Carl Linnaeus, whose own researches he had criticized as being too static. Essentially an advocate of a dynamic ecological approach, Gmelin identified contrasts between European and Siberian plant communities, drawing attention to the relationship between the latter and those of North America. Alexandrovskaya, 'Gmelin'; Belkovets, *Gmelin*; Elert, *Ekspeditsionnye materialy*.

<sup>2</sup> Ialutorovsk, known locally as Bakshansk, had been an *uezd* town since 1782. It was founded on the banks of the river 'Tobol' in 1639, on the site of a Tatar settlement, as a defensive fort against Kalmyk raids from the Ishim steppe. In the later nineteenth century it comprised some 326 houses, virtually all wooden, accommodating a population of nearly 3,500. It possessed a *gostinyi dvor*, two Orthodox churches, a forty-bed hospital and pharmacy, several craft workshops, but no factories. Its trade was insignificant, being confined to a weekly bazaar and four annual fairs. V. P. Semenov, *Zapadnaia Sibir'*, pp. 434–5.

Speedy coachmen very willingly drove my *tarantas* by *troika* 'on delivery' at the official rate (1.5 kopeks per *versta* per horse), handing over the passenger to each other. This saved us from tedious presentation and registration of orders for fresh horses, from waiting our turn while changing horses, and generally from unpleasant dealings with 'post-masters', who stood on the lowest rung of Russian bureaucracy, having been indiscriminately transferred to the lowest rank (collegiate registrar)<sup>1</sup> within my memory during the reign of Nicholas I, only in order to protect them from brutal beatings by 'generals' passing through. In Siberia, however, these beatings were rare. Given the excellent peasant horses and the very high level of the carrier's trade, at which the speed of travelling by post-chaise could reach 400 and more *versts* in twenty-four hours, generals were always pleased, and besides, the down-trodden and impoverished post official effaced himself and seemed superfluous compared to the wealthy and distinctive fine fellow of a head coachman, who was himself ready to sit on the coach-box of an impatient general in order to transport him through to the next station with panache and verve. For me, crossing Siberia 'on delivery' afforded so much the greater interest, as my halts and rests did not take place in boring government post-inns built to an official standard model, but in the cottages of wealthy Siberian peasants, who willingly engaged in the carrier's trade. A speedy *troika*, harnessed to my heavy *tarantas*, caught it up immediately and rushed in double quick time along the whole stretch from the station, except for the long uphill slopes, on which a Siberian coachman likes to travel at walking pace; moreover, the most interesting conversations would start up between him and me, in which the Russian peasant (and we met many such) was prepared to pour out all his heart without fear. However closely I knew my own fellow-countrymen – Riazan serfs – however trustingly they treated their *barin*, who had grown up near them before their eyes, all the same there was something reticent and constrained in their talk about their mode of life and philosophy, or in their statements of their needs, and a limit to their candour could always be felt. But the old peasant residents of Siberia, who had grown up and developed in its wide open spaces, did not know serfdom, and it was easier for them to pour out their hearts in conversations with people who came from afar and who did not belong to their local bureaucratic oppressors, the officials. That is why I successfully used my journeys, and even more my halts in the huts of Siberian peasants, in order to become acquainted with their way of life, agrarian conditions and philosophy.

The huts of peasants in southern *uezdy* of Tobol'sk province impressed me by their spaciousness in comparison with the cramped, chimney-less huts of peasants in the Great Russian black-earth provinces. Usually they had six windows

<sup>1</sup> Collegiate registrar was the lowest, fourteenth, civilian class in the Table of Ranks (1722). It bestowed hereditary gentry status.

facing the street, and sometimes as many as twelve; the roofs were of shingle, and sometimes were built as two storeys. In villages one also came across brick houses, roofed with iron, belonging to wealthy peasants. Peasant food was unusually plentiful. In the most ordinary peasants' huts I found three or four dishes served at dinner. Meat meals, which consisted of beef and veal, poultry and game, as well as fish, were half of their week-day food. This was combined with wheat and rye bread, *pel'meni*, the favourite dish of Siberian people, vegetables and dairy products, the latter in unlimited quantity. With the development of cattle-breeding and significant crops of flax and hemp, the home-made clothing of old Siberian residents was also incomparably better than the clothes of peasants in European Russia, especially in its black-earth zone.

Old Siberian settlers would not believe that in Riazan' province sometimes an entire household had only one sheepskin coat between them. Moreover, to them it did not seem possible to exist without each member of the family having their own warm clothes; in addition, if each one had their own separate set of clothes, it would develop personal individuality and enterprise; their various independent initiatives also contributed to this. Spaciousness was found not only in the house, but also in the pastures and fields; it excluded the petty family discords and disorders, which so frequently make life complicated for our European peasants and frequently force them, as a consequence of overcrowded dwellings, into premature and economically harmful family divisions.

All these conditions of life of the Siberian peasants ensured not only the strength of a household, but also the solidarity of the communal union, which the rural population felt to be an absolute necessity in the struggle against both elemental forces of nature and external enemies. In using family land-strips in good time, the communal union hindered individual house-owners very little. Each of them, by dint of unimpeded seizure, took as much land as he wanted, and, clearing it, managed it as he wished, often founding on this land both permanent and transferable farms (*zaimki*). Respect for someone else's clearings, and generally for someone else's household, was so great that usurpers of another's property did not exist among Siberian peasants, and the only brigands and robbers were fugitive convicts and wandering exiled settlers, whom, in the event of their committing robberies, the old Siberian residents hunted down, taking the law into their own hands. Only in cases when peasants, as they put it, suffered land 'cramping', that is an insufficiency of it, did the commune [*mir*] come into its own and take compulsory measures in order to regulate land relations, which always provoked the displeasure of some persons, and this was neutralized only by commune decisions, which were obeyed absolutely by all. No matter how bad and extortionate were the Siberian officials, who represented the dregs of Russian bureaucracy, strong communities successfully endured the struggle with them.

The Ishim was the second major Siberian river which lay on our way beyond

the town of Ishim.<sup>1</sup> We reached it via the Ishim steppe,<sup>2</sup> where rivers are seldom encountered, but which that spring-time represented a wet plain, rich in stagnant waters and covered with thickets of stunted birch-trees. The road through the Ishim steppe to a large extent looked like a wide log-path with deep ditches on either side.

On 31 May, early in the morning, we were within sight of the broad flooded channel of the Ishim, near the village of Abatskoe, standing in splendour with its two churches on the left bank of the river. The road was awful, the *tarantas* was thrown about from side to side so much that in spite of all my care for the safety of my barometer, it was smashed to smithereens. The Ishim flood was eight *versts* wide, that is twice as wide as the flooded channel of the 'Tobol', and hence its crossing took no less than five hours. Four or five times we ran aground on shoals in shallow water, but finally a gust of wind swept us onto the crest, that is onto a sand-bar which marked the bank of the river channel proper. When entering this channel, choppiness rendered our situation critical, and our craft might have been overturned if the oarsmen, who plunged into the water, had not managed to move our boat over the crest, and in a few minutes we were already in the rapid and stormy Ishim, over which we crossed in three-quarters of an hour. In the distance in front of us, arose the steep ledge of the right bank of the river, covered for the most part with turf and bushes. On the dry sandy soil of the intermediate zone I saw for the first time an extensive thicket of purely Asiatic vegetation forms, coating a large area with its golden cover. This plant, discovered and described for the first time by the great Pallas,<sup>3</sup> a form of *kasatika* (*Iris flavissima*), also belongs to the representatives of Siberian flora which like communal life.

The exposure of the steep ledge consisted of clayey alluvium, and beneath it horizontal layers of sand without any boulders. Having climbed onto the ledge, I saw again the unbounded continuation of the Ishim steppe, extending for a further 200 *versts* or so, across Omsk *uezd* as far as the Irtysh. Birch copses, meadows

<sup>1</sup> Situated on the left bank of the river of the same name in 'Tobol'sk guberniia, on the Great Siberian Highway, 362 km from Tobol'sk, Ishim was first recorded in 1670 as the hamlet of Korkinoe, becoming an *okrug* town in 1782. Although standing 20 metres above the river, much of the old town was flooded each spring. In the late nineteenth century it had 867 houses and a population of about 8,000. Its Nikol'skii winter fair was among the largest in Siberia, serving the rich steppe in which it was centrally positioned and attracting over 2,000 traders, the value of its traffic being estimated at over five million rubles.

<sup>2</sup> The Ishim steppe is quite hilly with numerous gullies etched by streams. In its northern areas it is well-watered and the *chernozem* layer is about 35 cm thick. Apart from the pines on the sandy banks of the river 'Tobol', its woodland is mainly deciduous, and in this respect it contrasts distinctly with the treeless Kirgiz steppe.

<sup>3</sup> Peter Simon Pallas (1741–1811), son of an army surgeon, was born in Berlin, studied at Halle, Göttingen and Leiden where he defended his doctoral thesis in 1760. In 1767 he was invited by Catherine II to lead an Academy of Sciences expedition to Siberia, during the course of which he visited the Ural Mountains, the Caspian Sea coasts, Lake Baikal and Kiakhta on the Mongolian border. In 1793–5 he undertook a second expedition to the Crimea where he was granted two estates near Simferopol'. Ratzel, 'Pallas'; Belousov, 'Pallas'; Raikov, *Ruskie biologi-evoliutsionisty*, pp. 42–105; Thomas, 'Pallas'.

and extensive areas of stagnant water alternated with each other. The vegetation cover of the damp steppe still had a European-Russian character. Downy lilac *son* (*Pulsatilla*), golden lychnis (*Adonis vernalis*), large white flowers of another anemone (*Anemone silvestris*), light-yellow slender *mytnik* (*Pedicularis sceptrum-carolinum*), tall red *medovik* (*Phlomis tuberosa*), and finally, in drier places, feather-grass (*Stipa pennata*), gracefully rippling in the wind, most of all characterized the steppe cover, to which a countless number of water birds lent an incredible animation. Ducks of different species were walking along the highway in pairs, rising only from under the rushing carriage. Numerous flocks of geese descended without fear onto countless small ponds, great snipes and snipes incessantly flew noisily out of the marsh grass. A little further away a female great crescent-beaked steppe curlew (*Numenius arquata*) with a sorrowful cry hovered near the galloping horses, as if wanting to stop them with the flapping of her long wings and to protect from their hooves her still helpless offspring, concealed somewhere in the tall grass by the steppe road. Further still, a pair of cranes, with a cry of fright and with their wings spread, was fighting with a steppe gerfalcon two paces away from the road, undisturbed by the galloping horses. The hen fell, toppled by the rapid onslaught of the gerfalcon, but the cock desperately attacked him, and the gerfalcon darting out from under the advancing horses, flew high and soared further above the steppe, looking out for an easier prey.

On the morning of 1 June near Krasnyi Iar we reached the Irtysh,<sup>1</sup> the third and most gigantic river of the West Siberian lowland. The outcrops which I came upon here no longer consisted of alluvium, but of undisturbed deposits of alternating sandy layers of the most recent formations from the freshwater basin. In all the outcrops along the Irtysh these sands contained a countless number of shells, collected by me and later described for the first time in *Zeitschrift der Deutschen geologischen Gesellschaft*.<sup>2</sup> Only later I discovered that these shells had not escaped the attention of Pallas, the great eighteenth-century explorer, but he mentioned them, however, without describing them.

At Krasnyi Iar I parted with my fellow-traveller, V. A. Poletika, who was going to Barnaul without stopping at Omsk, but he made me promise to stay at his place in Barnaul, where I should have to go after accomplishing my business in Omsk.

<sup>1</sup> The Irtysh, the main tributary of the Ob', rises on the border with China on the south-western slopes of the Altai where it bears the name Chernyi (Black) Irtysh, becoming known as the White Irtysh on its exit from Lake Zaisan. Thereafter the river flows in a north-westerly direction across the West Siberian Plain, its total length being some 4,200 km. In 1770 Pallas suggested that this great waterway might be linked via the Tobol's tributaries rising in the Urals to the upper reaches of the rivers Kama and Chusovaia and hence to European Russia, but all such projects were superseded by the railway link between the two basins in 1885. Until that time river networks represented the most effective means of transporting commodities over vast distances, except when they were closed by ice or low water. Commercial navigation on the Irtysh began in the early seventeenth century, but the first steamer between Omsk and Semipalatinsk did not operate until 1862.

<sup>2</sup> No trace of this publication has been found. In the bibliographies of Semenov's works the only item to appear in this journal was in 1854.



From the Irtysh crossing at Krasnyi Iar, where the colossal river was not in full spate by now, there still remained about forty-five *versts* to Omsk. I arrived there on 1 June towards evening and had to stay for two days in order to be introduced to the Governor-general, on talks with whom depended the possibility of accomplishing my cherished and secret intention to penetrate, at whatever cost, into the very heart of the unknown Tian'-Shan', the name of which was at that time hardly familiar to anybody in Omsk, since no-one there was familiar either with Humboldt's famous work *Asie Centrale*,<sup>1</sup> or with the volume of Ritter's *Asia* which referred to Tian'-Shan'.

Omsk,<sup>2</sup> which now has more than 100,000 inhabitants, had then no more than 16,000 souls, despite its great administrative importance, and more resembled a temporary military-administrative camp rather than an urban industrial-trading settlement. It was built on both sides of the river Om', at its confluence with the Irtysh, into which the town projected. On the right bank of the Om' was the fortress; inside it there was a church and a few official buildings, and among them there was the Governor-general's house, built of wood at that time. Outside the fortress was situated the large building of the central administration, from which a street descended towards the Irtysh; on this street for the most part there were located houses of the fourteen military and civilian generals who then lived in Omsk. All of these houses were wooden, very plain, and with neither gardens nor trees planted around them. Each house had only a spacious balcony, facing onto the wide and dusty, unpaved street. On the left, on the high bank of the river Om' there was the more extensive part of the town with two churches, a *gostinyi dvor*, a post office, shops, two squares and a boulevard of very pathetic willows. On the other hand outside the town, two *versts* below the town's boundary, on the high right bank of the river there was an extensive and beautiful park, a convenient and favourite place for promenades of Omsk's residents.

For me the most interesting personality in Omsk was, of course, the Governor-general himself, on whom the whole fate of my travels depended. At that time the Governor-general was Gustav Ivanovich Gasfort,<sup>3</sup> an elderly infantry general, who had made himself known as an outstanding military leader during

<sup>1</sup> *Asie Centrale, recherches sur les chaînes de montagnes et la climatologie comparée*, 3 vols, Paris, 1843.

<sup>2</sup> Founded in 1716 as the most easterly Russian outpost after the Gagarin expedition against the Dzhungarians, from 1882 Omsk became the administrative hub of the newly created Steppe governor-generalship. By the turn of the century, when it was reached by the trans-Siberian railway, it was the third largest town in Siberia with a population of 52,000, of whom military personnel represented nearly 8,500. It developed numerous factories processing local agricultural raw materials, while its commercial and cultural facilities served both the sedentary and nomadic residents of the so-called Kirgiz steppe. V. P. Semenov, *Zapadnaia Sibir'*, pp. 370–84.

<sup>3</sup> Gasfort (1790–1874) is described in *B&E* (15, p. 173) as a member of a Russian (*sic*) gentry family which originated in Prussia. Although the impression given by Semenov is that Gasfort had made a few powerful allies in Petersburg, the Governor-general was, nevertheless, a member of the State Council.

the Hungarian campaign. In spite of his peculiarities and human weaknesses, Gasfort was an exceptional person, and, of course, owed his brilliant career not to chance alone, but even more to his personal qualities.

After completing a course of studies at the Königsberg higher veterinary school, Gasfort joined the Prussian army as a veterinary surgeon at the beginning of the nineteenth century, and, during one of the wars against Napoleon waged by us in alliance with Prussia, was attached to Russian troops, who were in need of veterinaries on account of an epizootic which had been identified in our cavalry.

In one of the battles with the French, probably that at Preussisch-Eylau [8 February 1807], where many Russian officers were killed, Gasfort, who had acting commissioned status, so distinguished himself by his bravery in the heat of battle that he was re-assigned to officer rank and remained permanently in the Russian army. Then after the ending of the Patriotic War of 1812–15, Gasfort entered the newly-formed military school of column-leaders, the original cradle of officers of the Russian general staff. Having completed the course of studies there with brilliant success, he assumed Russian citizenship and became an officer of the General Staff.

During the Hungarian campaign of 1849 Gasfort was already in command of a division and became famous for his truly skilful retreat to Hermannstadt (Sibiu) in Transylvania, by which he warded off Györgei's<sup>1</sup> main forces and by doing so, gave other Russian troops a chance to circumvent the latter's army, which was what decided the outcome of the war.

Gasfort was very proud of his retreat to Hermannstadt. He said that in world history there were only three such retreats: the first was that of Xenophon; the second, Raevskii's at Smolensk; and the third, his own to Hermannstadt. When in 1853 the Governor-general of Western Siberia, Prince Petr Dmitrievich Gorchakov, on the appointment of his brother Prince Mikhail Dmitrievich<sup>2</sup> as Commander-in-Chief of the army in the field in the Crimea, expressed his wish to participate in the Sevastopol war, and took command of one of the army corps in the field, Nicholas I could not have found a more worthy successor to the West Siberian Governor-generalship than General Gasfort, also appointed by him as commander of the troops for all Siberia.

<sup>1</sup> Arthur Györgei (1818–1916) led the Hungarian Danubian Army in 1848–9 and joined with other insurgents to defeat Field-marshal Windischgratz, to relieve besieged Komarom and capture Budapest. Always at odds with Kossuth over the conduct of the revolt, he was eventually defeated at Temesvar and surrendered.

<sup>2</sup> Mikhail Dmitrievich Gorchakov (1793–1861) joined the Artillery Guards as a cadet in 1807, and after a short period in the Caucasus participated in the campaigns of 1812–14. He was awarded the Order of St George for his actions in the Turkish War of 1828–9 and was Chief of Staff of the First Infantry Corps in Poland in 1831. With the outbreak of the Crimean War he saw action in Wallachia, Moldavia, and the northern shores of the Black Sea, and led the defence of Sevastopol' from February to August, 1855. Following the death of Paskevich in January 1856, he administered the Kingdom of Poland and commanded the First Army until his own death.

It can be said that this was a particularly happy choice. Gasfort was one of the best educated officers in the Russian army, had received a high-class military education, and possessed great experience and undoubted abilities in military science, personal courage and irreproachable honesty. Unfortunately, Gasfort lacked administrative aptitudes; on the other hand, he was not a bureaucrat or conservative, but on the contrary, displayed personal initiative, especially in matters in which he considered himself to be at all competent.

The position of Siberian Governors-general in the middle of the nineteenth century was not easy, however, and in order to do anything useful for the region it was necessary to have either the statesmanship of a Speranskii<sup>1</sup> or the unbending will of a Murav'ev-Amurskii.<sup>2</sup>

The position of Governor-general of Western Siberia was no easier than that of Governor-general of Eastern Siberia. Under his jurisdiction there were two enormous provinces, Tobol'sk and Tomsk, and enclosing them to the south along the military border line the steppe regions of the Siberian Kirgiz and Semipalatinsk. On Tobol'sk province General Gasfort had almost no influence. It was governed in the usual administrative order from the provincial town of Tobol'sk by Viktor Antonovich Artsimovich,<sup>3</sup> an intelligent and experienced governor. Tomsk province was to almost a greater extent withdrawn from the effective jurisdiction of General Gasfort. Its centre of gravity was in the Altai mining

<sup>1</sup> Mikhail Mikhailovich Speranskii (1772–1839), the son of a priest, was educated at seminaries before becoming private secretary to Prince A. B. Kurakin, Tsar Paul's Procurator-general. He exerted considerable influence on Alexander I from his position as State Secretary in the Ministry of the Interior. His familiarity with western liberal and progressive ideas, together with his bureaucratic training, placed him in an ideal position to embark upon administrative reform and rationalization as assistant Minister of Justice in 1808. Opposition from the nobility and Speranskii's supposed Francophile stance led to his sudden exile to Nizhnii Novgorod in 1812. Two years later, he was rehabilitated and permitted to settle in Novgorod province, where the Vice-Governor was Count Murav'ev. After three years as Governor of Penza province, in March 1819 he was transferred to the governor-generalship of Siberia, where he attempted to rectify generations of neglect and corruption. Returning to Petersburg in 1821, he regained a measure of Imperial trust by his submissive acquiescence in the fate of the Decembrists, provoking A. I. Turgenev's verdict that 'he kept silent when silence was a crime'. See Raeff, *Speransky*.

<sup>2</sup> Nikolai Nikolaevich Murav'ev (1809–81) was educated at the Corps of Pages and served in the 1828–9 Turkish War and the 1831 Polish campaign. He joined the Ministry of the Interior in 1846, and as Governor of Tula acquired a reputation as a liberal and democrat. As Governor-general of Eastern Siberia (1847–61), he negotiated the 1858 Treaty of Aigun with China, settling the Amur frontier and earning the title Count Amurskii. He freed peasants from service in the Nerchinsk mines and created a 12,000-strong Cossack army corps to settle the Amur frontier. He left Siberia in 1861 when the territory was divided into two provinces, and was appointed to the State Council, but died in Paris and was buried in Montmartre.

<sup>3</sup> Viktor Antonovich Artsimovich (1820–93) belonged to a Polish Catholic gentry family but was regarded as wholly Russian in outlook. After completing law school, he entered service in the Senate, becoming familiar with the administrative and legal institutions in both European and Asiatic Russia. In 1854 he was appointed Governor of Tobol'sk, where he discovered that his predecessors had been grossly negligent in its administration and immediately set about rectifying the situation. From 1858 he was a progressive Governor of Kaluga during the era of peasant reform, despite an attempt by the local gentry and reactionary elements in Petersburg to discredit him.

district, the mining head-officer of which lived in Barnaul, and in relation to the economy of the district as a whole was subordinate directly to the Cabinet and the Ministry of Court and Crown Domains, only to a certain extent being under the supervision of the Tomsk governor, who was always appointed from mining engineers, so that in Tomsk province only the small number of troops situated in this region were under the immediate authority of the Governor-general, as Commander-in-Chief of troops throughout Siberia.

However, the two steppe regions of the Siberian Kirgiz and Semipalatinsk, with their then almost exclusively Kirgiz population,<sup>1</sup> were at the immediate disposal of the Governor-general. But the troops of the Siberian corps were placed under his command, as Commander-in-Chief of the troops of all Siberia, and the whole wide zone of Cossack lands from the border of Orenburg province through Petropavlovsk, along the entire Irtysh line<sup>2</sup> to Lake Zaisan were under his command as *ataman* of the Cossack troops. This territory corresponded to the subsequently created Steppe governor-generalship, prior to the transfer of Semirechensk region from it to the Turkestan governorship.

Yet even in administering this extensive territory the Governor-general was restricted a great deal by the Council of Central Administration of Western Siberia, the more so as this Council was not simply a consultative board, but was indeed an administrative institution, in which each member managed his own department, such as economic, financial, administrative, judicial, national minorities, and so on. Moreover, the Governor-general did not have a direct influence upon the appointment of members of the Council.

In the Council of Central Administration Gasfort found an already existing united gang of extortioners and bribe-takers (at the time of my visit to the town of Omsk in 1856 only one member of the Council did not take any immediate part in these abuses), whom, in spite of the great powers given by law to Governors-general, it was beyond his power to smash, as they were linked among themselves and with certain dark forces in the establishment of the capital by a golden chain. This did not prevent members of the Council of Central Administration from playing on all the Governor-general's weaknesses, which led straight away to a big mistake when choosing a head clerk of the Governor-general's chancellery.

One of Gasfort's weaknesses was his envious rivalry with the two neighbouring Governors-general and especially with N. N. Murav'ev, who although in the service quite a few years less than he, had already received the title of Count

<sup>1</sup> The 'Kirgiz' [Kazakh] population in Semipalatinsk totalled more than 547,000 at the end of the nineteenth century and represented 90% of the inhabitants of the district. *B&E*, 30, pp. 95-101; Krader, *Peoples of Central Asia*, pp. 51-170.

<sup>2</sup> The Irtysh Cossack line, established in the eighteenth century by Peter the Great as a defensive chain against the steppe nomads, ran for 900 km from Omsk to Ust'-Kamenogorsk. From 1745 outposts were created at intervals of 60-70 km, with lesser camps every 20 km. In 1747 the line comprised 5 forts, 15 redoubts, 8 outposts and several small camps. Having achieved its purpose, it was abolished in 1803. *BSE*, 18, p. 469 (with map); Longworth, *Cossacks*; McNeal, *Tsar and Cossack*.

Amurskii. Gasfort was so antagonistic towards him that in his eyes the best recommendation for an official was his statement that he had left office in Eastern Siberia due to troubles with the Governor-general. That was how Gasfort took as head clerk of his office a former head clerk ousted for bribe-taking by Murav'ev. The clever and experienced Pohekunin (the name of the official who was head clerk at Gasfort's office) united as far as possible the entire Council of Administration of Western Siberia and was the crafty and effective channel of all the embezzlements carried out by members of the Council, each one in his own department. Gasfort admitted later that he knew about their abuses, but claimed that he had them well in hand, from time to time 'reading the riot act' as a warning to them. What this amounted to was that, having gathered some facts about some large-scale abuses from the well-chosen officials of a special task force, he would give the accused a good dressing-down in everybody's presence, not even sparing harsh words, to which the culprits submitted meekly, not denying their guilt.

But with that the matter ended, and these same culprits, after waiting a little while, continued their abuses, adroitly protected by the head clerk. Not to mention abuses connected with bribes in the form of liquor, given by the Council to the embezzlers, the supply of bread to the troops and migrants in Semirechensk and Trans-Ili territories served as a still greater source of very large profits for members of the Council of the Central Administration. At the markets fixers received eleven and twelve rubles per quarter for delivery of bread ordered there, under the pretext of the high cost of its transportation along the Irtysh line into the heart of the Steppe and Trans-Ili territory, while they were themselves buying it from recently settled migrants at ninety kopeks to one ruble per quarter. Drinks of champagne galore at the feasts of senior Omsk officials and their gross cynical orgies could be explained by such profits, which were shared by the supplier with members of the Council.

However, even at that time in the administrative world of Western Siberia a fresh current of persons of integrity was making itself felt. Not to mention Artsimovich, the Governor-general of Tobol'sk, who managed to put in good order all of Tobol'sk provincial administration, almost all the officials selected by Gasfort himself turned out to be irreproachable. Right from the first year of his appointment, having satisfied himself that he was powerless to carry through any reforms whatsoever in the matter of governing the Russian population of Western Siberia, Gasfort turned all his attention to the Kirgiz regions subordinate to him. But in the region of the Siberian Kirgiz, populated almost exclusively by Kirgiz of the Middle Horde, he was extremely hampered by the fact that this horde was divided between the Western-Siberian and Orenburg governor-generalships. The history of constant revolts by the Kirgiz Sultan Kenisary Kasimov<sup>1</sup> in the first half of this century proves most graphically to what sad results

<sup>1</sup> In the period 1838-47 Sultan Kenisary Kasimov, son of the Kirgiz Sultan Kasim Ablav, created

would lead the chronic disagreement and hostility which existed during almost all of the nineteenth century between the two neighbouring governors-general, in whose hands lay the most precious interests of Russia with regard to the countries contiguous to it. This courageous Mithridates<sup>1</sup> of the Kirgiz steppe successfully fought against Russian dominion for decades by employing the tactic that, when he was being overpowered in the region of the Siberian Kirgiz, he would move over inside the limits of Orenburg's governor-generalship, where he not only received an amnesty, but also honorific awards at the hands of the governor-general. Then, having fallen out with the latter, he would again move into the territory of Western Siberia, where he would be received with honour by a new governor-general, who had been appointed during the interval. Only on those rare occasions, when both governors-general were up in arms against him, Kenisary would move within the boundaries of the Kokand khanate, under protection of the khan, who was no less hostile towards both governors-general than the latter were between themselves. And, during one such migration by Kenisary into Kokand's boundaries, it was not Russians but Kokand's Kirgiz subjects who managed to crush him – this occurred not long before the appointment of Gasfort to the post of Governor-general.

When Gasfort arrived in the territory with which he was entrusted, his first concern was to become acquainted with the mode of life of the Kirgiz people and to try to establish some kind of consistent and stable policy, to which the Russian authorities should adhere in governing the Kirgiz hordes and nomadic populations generally. It is noteworthy that Gasfort immediately realized that his predecessors and neighbours (the Western Siberian and Orenburg Governors-general) were making a very big mistake in vigorously and artificially inculcating with Islam the Kirgiz, while they had not wholly lost their ancient shamanistic beliefs and were still little imbued with Muhammad's teachings, and by providing their sultans and their *auly* with Tatar mullahs from Kazan'.<sup>2</sup>

But from his absolutely reasonable understanding Gasfort came to a strange and unexpected conclusion, which justified to a certain degree the nickname given to him by his peers. Doing justice to Gasfort's versatile education and

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many difficulties for the Russian administrations of Orenburg district and western Siberia. He aspired to complete freedom for the Kirgiz under Russian rule and their unification with co-religionists in Khiva. Taking advantage of wrangling between the authorities in Orenburg and Siberia and of Perovskii's unsuccessful campaign in Khiva (1839), he provoked periodic disturbances among the native peoples in the Kazakh steppe who declared him as their khan. However, in a skirmish with the Dikokamennyi Kirgiz, who avenged atrocities committed against their kinsmen, he was killed, though his heroic exploits were kept alive in folk tales and songs. A Russian translation of one of these was published in the *Zapiski* of the Orenburg branch of the Russian Geographical Society in 1875.

<sup>1</sup> This rather extravagant allusion is to Mithridates VI (the Great), King of Pontus, who over-ran Roman Asia in 88–87 BC and again in 83 BC. During a third war in 74–63 BC he was forced to take refuge in Armenia and was eventually defeated by Pompey.

<sup>2</sup> According to Krader (*Peoples of Central Asia*, pp. 118–40), there were mullahs in most villages in the nineteenth century, following Catherine II's ambivalent policies which sought to convert the

extensive erudition, they characterized him as 'an overturned book-case', in which everything got mixed up.

That conclusion, expressed in a report forwarded by him to Nicholas I in 1854, was as follows. In his, Gasfort's, opinion advocacy of the Christian religion could not be successful among the Kirgiz, since many customs and conditions of nomadic life, as for instance nomadic polygamy, were incompatible with dogmatic Christian teaching. On the other hand, conversion of the enormous Kirgiz nationality to Islam would be at odds with Russian state interests. Therefore, the Kirgiz must be given a new religion, adapted to the conditions of their life and conformable to Russian state interests. In defining the dogmas of this new religion, one must assume as a point of departure that kind of religion which was found in the Old Testament, namely Jewish, but having cleared it of Talmudic interpretations, and having reformed it in the spirit of Christianity, that is having added many dogmas of Christian religion to the commandments and teachings of Moses. A full draft of this religion, which revealed Gasfort's extensive theological knowledge, was submitted by him to Nicholas I, who, it is said, wrote a brief comment on the report: 'Religions are not invented like articles of the code of laws', and returned it to its author with an uncomplimentary reference to his ideas.

Deriving no satisfaction for himself either as an administrator of the numerous Russian population, or as a legislator for the no less numerous Kirgiz population, Gasfort had devoted all his energy to taking care of the most remote outlying districts of his governor-generalship, to the Arctic Berezov krai<sup>1</sup> and to Semirech'e, the most southerly of our Asiatic domains at that time. He was the first governor-general who personally visited these two extremities of Western Siberia, separated from each other by 30° of latitude.

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Bashkirs and Kazan' Tatars to Orthodoxy, yet patronized the Kazakhs ('Kirgiz') as Muslims, whether they were or not. The latter were mistakenly regarded as being the same as the Volga Tatars, whereas they lacked significant Islamic influence in the eighteenth century, retaining shamanist beliefs. Another misconception on the part of Russian administrators in Moscow was that the Kazakhs spoke Tatar, so that Tatars were employed as intermediaries in the process of extending Russian influence over the steppe peoples. Islam was thus used as a means of stabilizing the cultural organization of the indigenous people, gradually bringing it under Russian control. For other insights, see MacKenzie, in Rywkin, ed., *Russian Colonial Expansion*, pp. 208-34; Curzon, *Russia in Central Asia*, pp. 382-414; and Bräker, in Katkov ed., *Russia*, pp. 182-98.

<sup>1</sup> Berezov krai was the most northerly district in Tobol'sk province, occupying just over one million square kilometres, but having a population in the late nineteenth century that scarcely exceeded 31,000, only about 2,000 of whom lived in the town itself. Situated at nearly 64°N, 1,080 km from Tobol'sk and 4,125 km from Petersburg, Berezov was one of the most northerly inhabited places in the Empire, amid bleak tundra plains. The settlement was founded in 1593 as a collection point for taxes from the Ostiaks, dues that were rendered in pelts. From the early eighteenth century it served as a place of exile, mainly for 'state criminals', whose number included Prince A. D. Men'shikov, Prince Ivan Dolgorukii and Count Ostermann. The dense forests were full of wild life and trade in furs and dried or salted fish provided a livelihood for many of the residents of the town which had been raised to *uezd* status in 1782. V. P. Semenov, *Zapadnaia Sibir*, pp. 90-92 and 410-18.



PLATE I. River Charysh (no. 73)

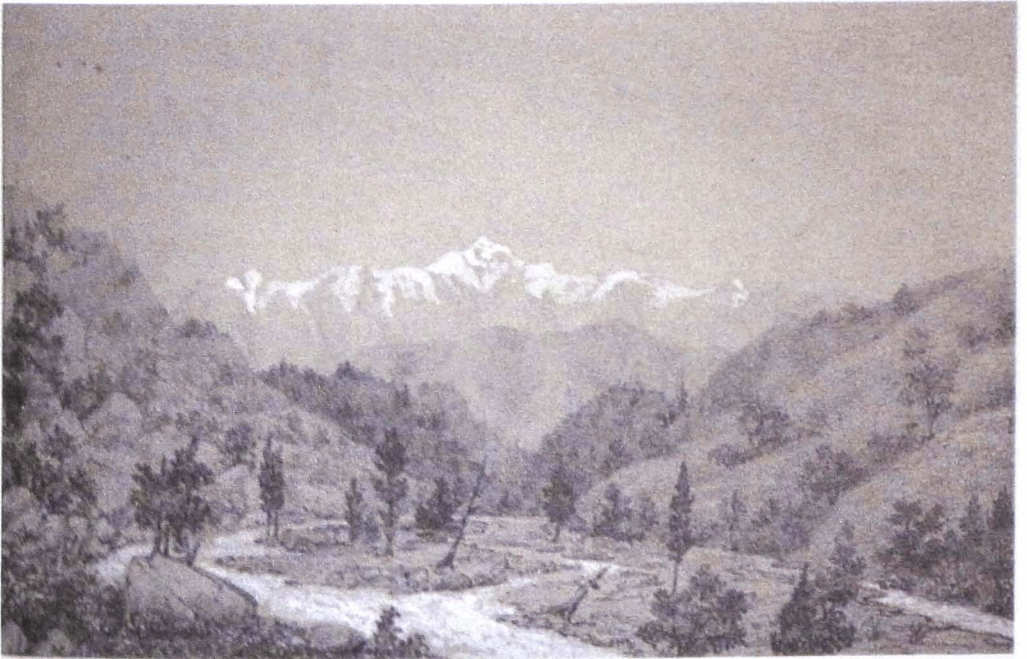


PLATE II. River Charysh and the Charyshskie belki (no. 81)



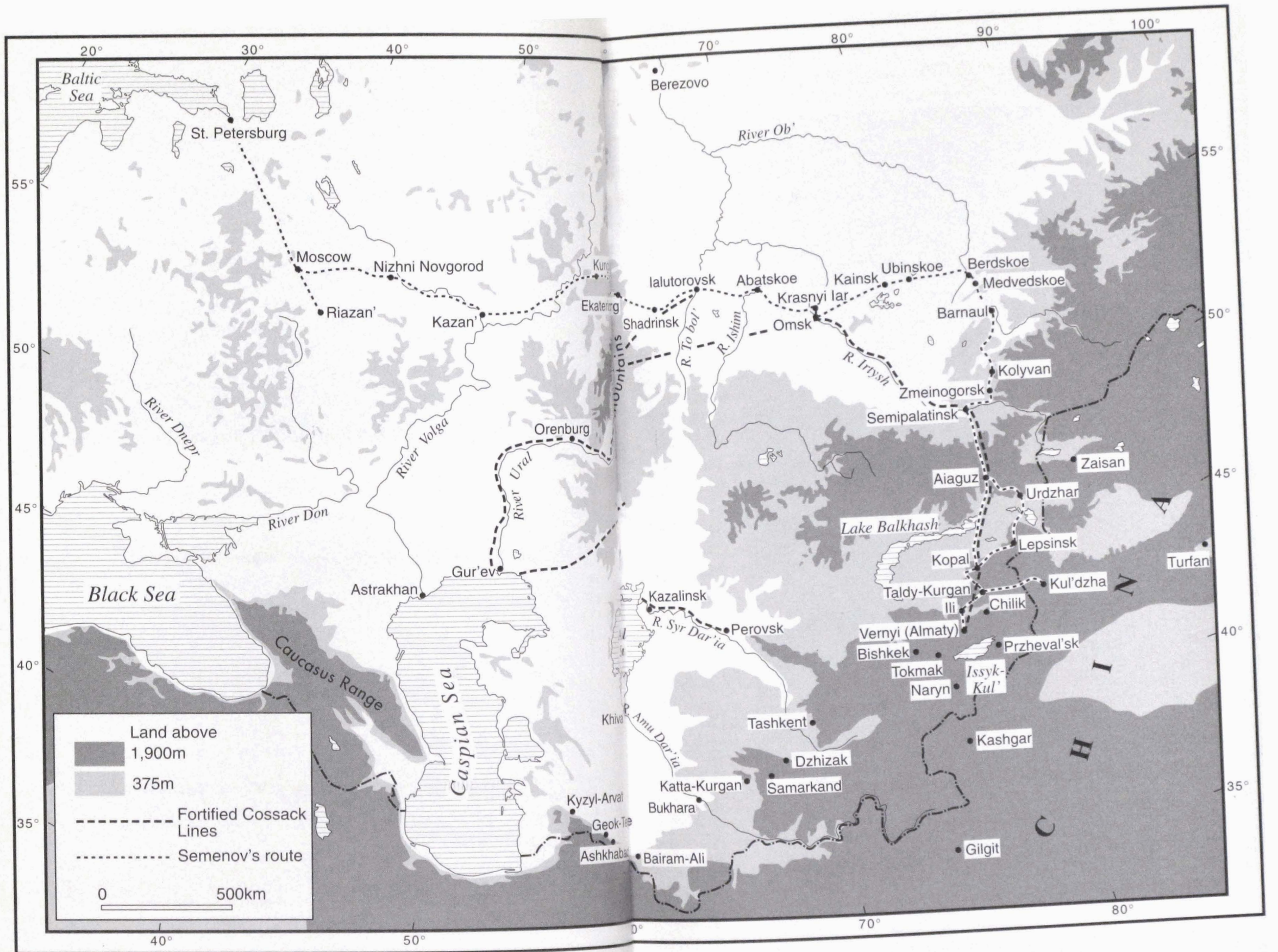


FIG. 1. Semenov's route from St Petersburg to the 'Tian'-Shan'

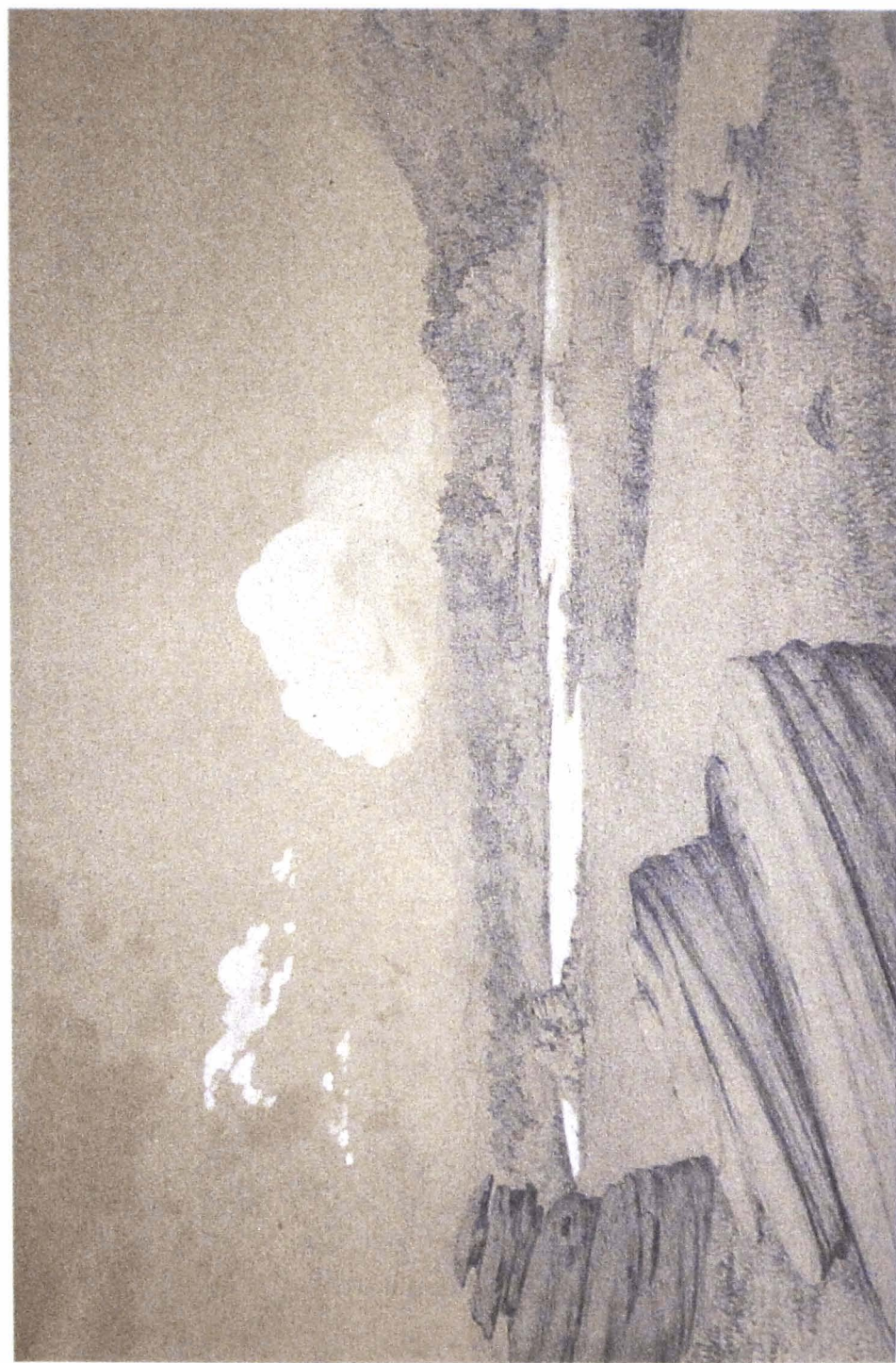


PLATE III. General view of Kolyvan' lake (no. 80)

In Berezov and Obdorsk<sup>1</sup> territories he found an intelligent and kindly master of an extensive territory in the person of the Berezov district police officer. No matter to whom – Tobol'sk's Governor Artsimovich or Governor-general Gasfort – belonged the honour of appointing this person, remarkable in his administrative abilities, from the ranks of unknown modest army officers to the post of Berezov district police officer, in any case the choice was successful in the highest degree. Later this Berezov district police officer G. A. Kolpakovskii, having progressed through the posts of *pristav* of the Great Horde, Governor of Semirech'e district, and assistant to the Turkestan Governor-general, himself became Steppe Governor-general, and in all the posts he held he rendered his fatherland services never to be forgotten. In any case, Gasfort's contribution was that he was the first to promote such a worthy man.

Happy now concerning Berezov *krai*, Gasfort concentrated all his attention on Semirech'e, and here he now felt that he was complete master, not encountering any opposition in the Central Administration of Western Siberia, as Gasfort's activity in this remote outlying district was just what they wanted. Progress into the heart of Asia and colonization of Semirech'e, building a road there and establishing means of communication with emerging settlements, called for numerous deliveries and contracts, carried out by the Central Administration, and yielded rich spoils to its members.

In the town of Kopal,<sup>2</sup> founded by Prince Gorchakov, Gasfort also found a good master in the person of Abakumov, a talented and energetic lieutenant-colonel of the Siberian Cossack army, who was able to maintain the prestige of the first large Russian agricultural settlement on the territory of the Great Kirgiz Horde. But even Gasfort's visits to Semirech'e territory did not remain without a trace. With a pick and an axe in his hands he set out to build a better road to Kopal across one of the chains of the Semirechensk Alatau, over a pass which received the name of Gasfort, then promoted the formation of two new local *stanitsy* – Lepsinsk in one of the high valleys of the Alatau, and Urdzhar on a

<sup>1</sup> Obdorsk, originally known as Nazova or Nozova, had been founded by Cossacks in 1593 on the site of a Samoied settlement, and acted as a stronghold for Russian adventurers in the far north. In the later eighteenth century the fort was removed and Russian settlers became more permanent, particularly with the growing prosperity of the fair which lasted from 15 December until 25 January. Exchange with the migrating Ostiaks and Samoieds and payment of taxes (*iasaka*) took the form of barter, in which the value was calculated in terms of fox-pelts, the equivalent of 32 to 4 rubles at the turn of the century. In return for animal skins, furs, mammoth tusks, birds' feathers, walrus ivory, fish and isinglass, Russians from Tobol'sk brought bread, flour, wine, tobacco, canvas, beads, rings, iron and copper utensils, mirrors and brightly coloured cloth. V. P. Semenov, *Zapadnaia Sibir'*, pp. 308–11, 350–5 and 415–18; Bartenev, *Na krainem severo-zapade Sibiri*.

<sup>2</sup> Kopal, an *uezd* town founded as a Cossack *stanitsa* in 1841, the adjacent settler town in 1854. In 1897 its population was 2,847 in 348 households, with a further 2,112 in 323 households in the *stanitsa*. The majority were Kirgiz with some Kalmyks, and both settlements had many more males than females. Most inhabitants were agriculturalists, though there were 51 retailing stalls (*lavki*), 48 water-powered flour-mills, some smithies, tanneries, tileries and candle-makers. The town catered for local trade as well as longer distance traffic with China through Kul'dzha.

tributary of Lake Ala-kul', near the Chinese town of Chuguchak. Sites for these *stanitsy* were chosen very successfully, and all three of these important settlements became firm strongholds of Russian rule in Semirech'e. Then the road from Semipalatinsk to the river Ili, with its well established stations (pickets) every twenty to twenty-five *versts*, which were provided with sufficient numbers of Cossacks and horses, was put in good order after General Gasfort's visit to Semirech'e.

But his greatest achievement was the occupation of the Trans-Ili territory. Better by virtue of its climate and fertile soil, with the possibility of irrigation, this little corner of the Western Siberian governor-generalship, which represented the northern slope of a gigantic mountain ridge (Zailiiskii Alatau) towards the Ili plain, was long since disputed territory between our subjects, the Kirgiz of the Great Horde, and Karakirgiz tribes:<sup>1</sup> the Bogintsy, Chinese subjects, and the Sarybagish, Kokand subjects. The courageous and enterprising sultans of the Great Horde readily volunteered to be our pioneers in seizure of the lowlands disputed by the Karakirgiz, the alpine meadows of which had been readily frequented by them since the time when they began to feel behind them the firm stronghold of Russian colonization of Semirech'e.<sup>2</sup> On his very first visit to this territory, Gasfort decided to seize the entire northern slope of the Zailiiskii Alatau once and for all. As an experienced military leader, he had satisfied himself that the tribes, which were the subjects of two different states and which were at loggerheads with each other, did not constitute a serious obstacle to the seizure of the Trans-Ili territory, but that he might meet obstacles to the achievement of his objective only in Petersburg, where he had neither those connections nor that authority which constituted Murav'ev-Amurskii's strength.

Moreover, in the autumn of 1854 Gasfort decided to send a reconnoitring detachment, consisting of one battalion of infantry and 300 Cossacks, across the river Ili. The expedition was a success. Seventy *versts* from the river Ili, at the very foot of the Zailiiskii Alatau, where the river Almaty emerges from the mountains, the expedition had spied out an ideally beautiful place for a Russian settlement, the beginning of which was instituted there and then by the foundation of a Trans-Ili fortification, which was renamed Vernoe in the following year. Although in these foothills not a single tree grew, the valley facing it was rich in forest, and the abundance of water in it afforded the possibility for artificial irrigation of the entire foothill area. During their further reconnaissance along the foot of the mountain ridge to the west, the detachment was surrounded by a countless number of Karakirgiz, the subjects of Kokand, but still returned to the river Ili without losses.

<sup>1</sup> The name Kara-Kirgiz was formerly given to the Kirgiz to distinguish them from the 'Kirgiz-Kaisak', or Kazakh peoples. In the late nineteenth century there were estimated to be about 850,000 'Kara-Kirgiz', of whom 300,000 lived within the then borders of the Russian Empire. Akiner, *Islamic Peoples*, pp. 327-38; *B&E*, 29, pp. 101-8.

<sup>2</sup> Williams, 'Russian Peasant Settlement'.

In the summer of 1856 the final occupation of the foothills took place. The army and Cossacks settled in the place chosen for founding the fortification of Vernoe,<sup>1</sup> and began to cut trees in the Almaty valley for the first essential buildings. The first encounter of Russian settlers with the Dikokamennyi Kirgiz,<sup>2</sup> who had been migrating to the south-west, was very hostile. On the very first night of the Russians' installation a strong Karakirgiz gang stole a herd of Russian horses fifteen *verst*s from Vernoe, having killed twelve Cossacks, whose heads were found on lances at those places where they were guarding the herd. In the autumn Gasfort himself visited the first occupied foothills. However, the real colonization by Cossack and peasant families began only in the spring of 1857.

I return to my recollection of the first day of my acquaintance with General Gasfort in Omsk. He received me very affably; there is no doubt that in the conditions in which he found himself, the arrival of a member of the Russian Geographical Society, which already enjoyed great authority, sent on an official mission to his territory, was precisely in the interest of the Governor-general, who was seeking any kind of support in his undertakings on the part of independent, unbiased and authoritative witnesses of his actions.

When I was presented to Gasfort I was very careful not to say a word apropos the main purpose of my travel to Tian'-Shan'. I only expressed the profound sympathy of the Geographical Society for Gasfort's activities on the south-eastern outskirts of the Kirgiz steppe and particularly for the movement of colonization into the Trans-Ili and Semirech'e territories, and I informed him that the Society had commissioned me to study both the nature of the territory peacefully conquered by him, and the successes of Russian colonization in it. That is why I did not have any doubts, I said, that the enlightened initiator of our advance into Central Asia would provide me with an opportunity not only to visit Vernoe, but also to study, as far as possible, the geological structure of the territory, its flora and fauna, as well as the population of the neighbouring mountainous country.

In reply to this, Gasfort expressed the hope that his role as the bearer of enlightenment to Central Asia could bring more benefit to Russia than the precocious, in his opinion, occupation of the waterway passing through a foreign

<sup>1</sup> Vernyi or Vernoe (in the Soviet period Alma-Ata, now Almaty), 1,000 km from Semipalatinsk, was created as administrative centre of the Alatau *okrug* with the occupation of Trans-Ili district in 1853 and subordination of the Great Horde the following year. Its fort, built on the site of an earlier native settlement, Almaty ('Apples'), was intended as a bulwark against Kara-Kirgiz raids. When the Turkmen Military District became Semipalatinsk *oblast'*, Vernyi was its capital and the base for the Semirechensk Cossack cavalry. In 1891 the town consisted of the old quarter (Almatinsk *stanitsa*), Almatinsk *vyselok*, a Tatar *slobodka* and the new Russian town, altogether housing 22,245 inhabitants.

<sup>2</sup> Diko-kamennyi, as an alternative name to 'Kara-Kirgiz', applied to the Kirgiz of Eastern Turkestan, appears to have been used by the explorer Meyendorf, who had called the steppe nomads 'Kirgiz-Kaisak', or simply 'Kaisak'.

state by his renowned neighbouring governor-general, and that his peaceful conquest of a territory richly endowed by nature would later be appreciated by history. For the time being, he had to rejoice now that the Russian Geographical Society, respected by the whole of Europe, had turned its attention to the territory only just occupied by him, and therefore he saluted a young scientist seeking to study it. Moreover, Gasfort promised immediately to fulfil my wish and to order the local authorities to render my researches the broadest possible assistance and to give me adequate escort for my excursions in the mountains of the Trans-Ili territory, and also to send after me topographers to make surveys of all my routes as far as possible.

There and then Gasfort introduced me to the man in charge of all topographical works in Western Siberia, Major-general Baron Sil'verhel'm,<sup>1</sup> and instructed him to show me not only all summary cartographical works but also all the plane-table surveys<sup>2</sup> made in Kirgiz regions in the time of Gasfort's administration.

The Governor-general's instruction was carried out with pleasure by the honest and good-natured Finlander, especially as he hoped that the Geographical Society with its connections with Headquarters would remind it of the necessity to supply Omsk speedily with good instruments. It turned out that generally the plane-tables and instrumental surveys of Omsk topographers were beautifully carried out, and that only in summary cartographical works were major shortcomings observed, which were explained by the fact that surveys of such huge spaces could not be made either simultaneously or uniformly. Different areas were surveyed by different topographers and, moreover, at different times, some with instruments, others by estimation by eye. Yet others were marked on the summary maps only by way of answers to questions, and the collation of all this ill-matched material was carried out hurriedly and prematurely on the sudden demand of the authorities, to please them. And what part was played by this satisfaction the Omsk topographers explained to me.

At one time Gasfort was brought, at his request, a few new plane-table surveys. Examining them very carefully, he noticed that in some interfluvial areas of the Kirgiz steppe there were no hills at all at watersheds, and enquired why the

<sup>1</sup> Major-general Sil'vergel'm [Silverhelm] was a member of a baronial family descended from the early eighteenth-century Swedish Field-marshal Goran Silverhelm from the Grand Duchy of Finland.

<sup>2</sup> Plane-tabling is a graphical method of small- or medium-scale surveying in which the map is drawn in the field, rather than being compiled subsequently from mathematical observations. The plot is made on paper pasted onto a levelled board set on a tripod, distance measurements being taken from previously established control points, and vertical variations observed by means of a clinometer. If all the correct procedures are followed, the method is accepted as being a quick, inexpensive and accurate way of mapping tracts of open country, at least under good weather conditions. Normally, the only post-survey work, in W.S. Whyte's words, 'consists of simply tidying up the drawing', (*Basic Metric Surveying*, p. 274); the adjustments carried out in this case somewhat exceeded what he had in mind! Clendinning and Olliver, *Surveying Instruments*, pp. 233-46.

hills were not marked there. Receiving the reply that there were no hills in these localities, Gasfort remarked that the topographers with their lack of culture had no basis for their opinion, and that, according to his own understanding, there must be hills here. A few days after that Gasfort was presented with a summary map of the Siberian expanse of the Kirgiz steppe, on which the hills, whose existence he had presumed, were plotted too! Gasfort was very pleased by the fact that the hills turned out where he supposed them to be, and to my enquiry of Baron Sil'verhel'm as to what happened to the original plane-tables, I received the answer: 'We had not changed the plane-tables, of course, but only hid them. And when plotting the summary map, how could we not humour the old man?'

During my short stay in Omsk I managed to get acquainted, although rather superficially, with the best public figures of the town, whom I have already mentioned above. But my particular attention was drawn to two talented young officers, who not long before that had completed the course at Omsk military school, and who were themselves seeking an opportunity to become acquainted with me.

One of them, a Cossack by birth, struck me not only by his curiosity and diligence, but also for the unusual, absolutely ideal purity of heart and honesty of his staunch convictions; he was Grigorii Nikolaevich Potanin,<sup>1</sup> who later became famous as a traveller and explorer of Siberia and Central Asia. He was the son of a very talented and enquiring Cossack officer, who in the first quarter of the nineteenth century had frequently been sent on missions to the Kirgiz steppes. Travelling through them within the limits of the Siberian Kirgiz region (now Akmolinsk), he went as far as the banks of the river Chu and the borders of Kokand khanate. Some of his interesting routes and surveys, estimated by eye, came into the hands of Humboldt and were used by him in his *Central Asia*. Towards the end of his life, in spite of his fame and services, Potanin's father was reduced to the rank of a mere Cossack, but his son was accepted into the military school in the town of Omsk and completed the course there with great success. At that time Cossack officers of the rank of cornet received pay of only ninety rubles a year and supplemented their budgets by minor extortions from

<sup>1</sup> Grigorii Nikolaevich Potanin (1835–1920) was educated at the Omsk Cadet School and spent his childhood on the fringe of the Kirgiz steppe, later serving as an officer in the Trans-Ili *krai*. He attended Petersburg University (1858–61) and took part in Struve's expedition to Lake Zaisan in 1863–4, becoming secretary to the Tomsk provincial statistical committee in the following year. He was accused of seeking the separation of Siberia from Russia and was sentenced to hard labour in Sveaborg, but on the intercession of the Geographical Society was pardoned in 1874. In the spring of 1876 Potanin was sent on the Society's expedition to north-west Mongolia which lasted for two years and this was followed by a second to central Mongolia (1879), a third to China (1884), and a fourth to eastern Tibet (1885–6). In 1892 he led a new expedition to China and Tibet, visiting several localities never previously seen by Europeans, but returned to Petersburg when his wife, Alexandra, who assisted his ethnographic researches, died near Kiakhta in September 1893. Sagalae and Kriukov, *Potanin*.

the Kirgiz, which with their missions and their official duties in the Kirgiz steppe were easy to carry out. But in this respect G. N. Potanin was the sole exception. Acting unswervingly in accordance with his pure and honest convictions, he did not carry out any extortions from the Kirgiz and managed to live on his ninety rubles. With the permission of higher authorities he busied himself with sorting out the Omsk archives and extracted from them valuable data for the history of Siberia and the Siberian Cossack army. It goes without saying that I not only became interested in the fate of the young officer, but also, as I got to know him better, tried to develop in him a love of nature and natural science, and that was what later attracted this outstanding young man to Petersburg University and made of him a remarkable traveller, ethnographer and naturalist.

The other person in whom I became especially interested in Omsk was Chokan Chingizovich Valikhanov.<sup>1</sup> A Kirgiz of the Middle Horde by birth, he was a grandson of the last Kirgiz khan Vali<sup>2</sup> and a great-grandson of the famous Ablai-khan,<sup>3</sup> a descendant of Chingiz-khan. His mother was a sister of Kenisary Kasimov, the 'Mithridates' of the Kirgiz people. His grandmother on his father's side, the widow of Khan Vali, and her children remained loyal to Russia, whereas the rest of her relatives, children from his first marriage, and his brothers did not want to recognize the fact that Khan Vali had become a Russian citizen. Alexander I was very attentive to the widow of Khan Vali and ordered to be built for her the first house in the Kirgiz steppe, and it was there Chokan Valikhanov was born. Possessing absolutely outstanding abilities, Valikhanov completed the course at Omsk military school very successfully, and later, now in Petersburg, under my influence attended lectures at the university and mastered the French

<sup>1</sup> Chokan Chingizovich Valikhanov (1835–65) was born in Kokchetav *okrug*, and was educated at the Omsk Cadet School, where he was influenced by Decembrist, *narodnik* and Petrashevtsy exiles, including Dostoevskii and Durov. In 1858, disguised as a merchant, he penetrated to Kashgar, collecting historical and ethnographical material, which he subsequently analysed as alternative sources for the reconstruction of the life of the pre-literate peoples of central Asia, though little of his work was published up to his death because of opposition on the part of the Petersburg establishment. Semenov, who nominated him for membership of the Geographical Society in 1857, edited some of his researches for publication in the Society's *Izvestiia* in 1868. Tokarev and Makhova, 'Ch. Ch. Valikhanov', pp. 331–6; Sulejmenov, 'Chokan Valikhanov', pp. 29–39.

<sup>2</sup> Khan Vali (1716–1821), eldest son of Ablai khan and a direct descendant of the sixteenth-century Siberian Khan Kuchum. Vali Khan recognized the supremacy of Russia in 1782 and ruled the Middle Horde for 40 years. His death at the supposed age of 105 gives rise to a problem in relation to the stated year of birth of his father (see note below). *B&E*, 9, p. 415.

<sup>3</sup> Ablai, or Abulai, Khan (?–1781) was one of the sovereign sultans who emerged after the Dzhungarian wars and became Khan of the Kazakh Middle Horde in 1771. In 1740 he took Russian citizenship, and upheld peaceful relations with Russia. Aspiring to build a Kazakh state on the basis of an appanage system, his domain covered the western portion of the Starshei *zhuga* (horde) and some clans of the Northern Kazakhs. His rule brought considerable economic and cultural development as a consequence of closer contact with Russian populations in the border regions. The first edition of *BSE* (1, p. 21) gives his year of birth as 1711, which is clearly incorrect in view of the note above, and the third edition amends the entry to record an unknown year of birth.



and German languages so well that he became remarkably erudite on the history of the Orient and especially of the peoples related to the Kirgiz. He would have become a fine scholar if his death, caused by consumption, had not removed him prematurely in the twenty-eighth year of his life. It goes without saying that I considered it my duty to draw General Gasfort's special attention to this talented young man, and, on returning from my travels in the Tian'-Shan', I suggested that he send Valikhanov wearing Kirgiz dress with a merchant caravan on a mission to Kashgar, and this was subsequently accomplished by Valikhanov with total success.

The purpose of my two-day stopover in Omsk was fully achieved, and on 3 June I left Omsk for Barnaul. On the way to Barnaul, between the Irtysh and the Ob' there extended for about 700 *versts* the wide and interesting Barabinsk steppe,<sup>1</sup> or Baraba, which at that time still attracted little Russian colonization. My road to the town of Kainsk, 400 *versts* away, went along the river Om'. For the first thirty *versts* I passed through treeless steppe, but then on crossing to the right bank of the river I came upon thickets of stunted birch-trees, *kolki*. In the gullies of the high left bank of the Om' could be seen drifts of snow, not yet melted. On the steppe itself the most characteristic grasses were *kovyl'* (*Stipa pennata*: feather-grass) and *medovik* (*Phlomis tuberosa*).

On 4 June the weather was stormy and cold, and it was hailing. The surroundings were tiresomely monotonous. The villages we came across were worse built and seemed to be poorer than in Tobol'sk province. The town of Kainsk,<sup>2</sup> in which we arrived towards the evening, differed little from large Siberian villages; there was only one church, though there were up to 2,700 inhabitants in 470 households.

After Kainsk I finally parted with the Om', and by the morning of 5 June I had already reached the most typical part of the Barabinsk steppe, the main features of which were a multitude of lakes and an almost total absence of running water. Beyond Ubinskoe settlement, in the distance to the left of the road there was the

<sup>1</sup> Barabinsk steppe stretches between latitudes 52° and 56°N, at an average altitude of 110 metres above sea level, between the Rivers Irtysh and Ob', although the name was formerly incorrectly extended to other districts of Tobol'sk province. Baraba and Berezovaia were characteristically covered by numerous birch coppices and marsh-lakes, many of which began to dry out in the later nineteenth century, leaving salt pans, the development of which was illustrated by Iadrintsev's comparisons between maps of the eighteenth and nineteenth centuries. In the 1740s twenty post-stations were built between Tara and Tomsk, and improvements in communications enabled Governor D. I. Chicherin (1720–85) to attract exiled land-owners, peasants and fugitive soldiers as settlers two or three decades later, despite the fact that the marshy environment often proved unhealthy. V. P. Semenov, *Zapadnaia Sibir'*, pp. 14–16, 121–5 and 131–7.

<sup>2</sup> Kainsk was founded in 1722 as a protection against the Kalmyk and Kirgiz. Fifty years later a *sloboda* had grown around the fort and in 1782 the settlement received *uezd* town status. Between 1823 and 1893 its population increased from 1,625 to 8,896, one-eighth of whom were Jews. Its numerous industrial enterprises were primarily based on agricultural raw materials (salt, leather, vodka, beer, soap, flour), but the ferry across the river Om' and the annual fair served a wider hinterland along the great Siberian post-road across the Barabinsk steppe. V. P. Semenov, *Zapadnaia Sibir'*, pp. 452–3.

extensive Lake Ubinskoe.<sup>1</sup> The low-lying, marshy surface of the steppe was overgrown with thickets of birch and willow. Some copses were adorned with bunches of Siberian *kupal'nitsa* (*Trollius asiaticus*) of a dark orange, fiery colour. A pink primrose (*Primula cortusoides*), alien to our European-Russian plain, appeared in the steppe. The most widespread shrub was our ordinary, so-called yellow acacia (*Caragana arborescens*), which, having been brought from Siberia in the seventeenth century, filled the gardens of our ancestors.

The multitude of freshwater lakes in the Barabinsk steppe which did not have drainage contradicted the widespread conviction among geographers that any lake not having drainage turned into salt-water. Obviously, the question of what conditions can preserve in their freshwater state lakes without drainage, and under what conditions they became saline, could be resolved only by careful and comparative study of the freshwater lakes of the Barabinsk steppe and the salt-water lakes of the Kirgiz steppe, and although Barabinsk steppe was later visited and studied by such a thorough scientist as Academician Middendorf,<sup>2</sup> there is a great deal that still remains to be done in studying the lakes of Central Asia, to which the Russian Geographical Society has devoted, and still devotes, attention throughout the past thirty years of its activity.

On 6 June at nine o'clock in the morning, out of the dense pine forest which accompanied its course, there appeared the majestic river Ob'.<sup>3</sup> On its sandy banks for the first time there appeared some Siberian vegetation forms: splendid purple *ostrolodochnik* (*Oxytropis uralensis*) and a kind of wild pea (*Orobus alpestris*), but predominant in the pine forest were ordinary European red bilberry, bilberry, bog whortleberry and so on.

It took me all day, from half past nine in the morning to sunset, to cross the Ob'. In order to make this crossing we had to be towed upstream for about nine *verst*s. This whole procedure lasted about seven hours. After that we started going across the Ob' but, having reached the middle, we were overtaken by a heavy thunder-storm. Rain, accompanied by continuous lightning and heavy peals of

<sup>1</sup> Ubinskoe, a fresh-water lake measuring 48 by 21 km, its depth varied from 3 to 7 metres. Its clayey-sandy banks were low, marshy, and uninhabited, although its waters were rich in perch, carp and pike. V. P. Semenov, *Zapadnaia Sibir*, p. 455.

<sup>2</sup> Alexander Fedorovich Middendorf (1815–94), son of a Livonian land-owner, studied at Dorpat University (1832–7), graduating in medicine, and continuing his academic career at Berlin, Erlangen, Vienna and Breslau. In 1840 he participated in Baer's expedition to Lapland and in 1843–4 went on the Academy's expedition to Siberia. He was elected to the Academy in 1850 and became its permanent secretary in 1855. He conducted valuable work for the Free Economic Society, of which he was President in 1859–60, and the Geographical Society as its Vice-President. In 1867 he accompanied Grand Duke Alexei Alexandrovich on a tour of Russia and in 1870 went with Vladimir Alexandrovich to the White Sea and Novaia Zemlia to study the effects of the Gulf Stream east of the North Cape.

<sup>3</sup> The Ob', rising in Biisk district, Tomsk province, and flowing more than 3,700 km to the Arctic Ocean, is one of Siberia's greatest rivers. Its width of up to 3 km and average depth of 20 to 30 metres in its middle course renders it easily navigable for steamers as far as Biisk in the ice-free period between late April and late October.

thunder, engulfed us. With difficulty we pulled in to the shore, where on a hill there was a large village with three churches, Berdskoe.<sup>1</sup>

The Ob' between Barnaul and Berdskoe makes an enormous bend, so that on our way from the Barabinsk steppe to Barnaul, which is on the left bank of the Ob', we had to cross the river twice. I did not stop in Berdskoe, and continued my passage across the area bounded by the Ob', in the middle of which flows the river Chumysh, a right-bank tributary of the Ob'. To my regret I had to drive through the second station from Berdskoe, the village of Medvedskoe, by night. However, these undulating and picturesque surroundings interested me extremely because here were the first exposures of solid rocks (argillaceous schists, crystalline diorites and conglomerates) of the Altai upland, which served as a continuation of the bulge of the Salair ridge,<sup>2</sup> and which caused the bend or *luka*, formed by the Ob'.

When on the morning of 7 June I reached the river Chumysh, I met there the same sandy soil, the same pine forests and the same common European-Russian vegetation. From the Chumysh to the second crossing we travelled about forty *versts*; we descended to the Ob' along an oblong sandy hillock, on which I was delighted to encounter three splendid Asiatic forms of vegetation new to me: astragal (*Astragalus sabuletorum*), *solonechnik* (*Statice gmelini*) and a fragrant yellow wild lily (*Hemerocallis flava*). The Ob' crossing here was not nearly as difficult or dangerous as at Berdskoe; to Barnaul from the crossing there remained now only thirty *versts*, and by six o'clock in the evening I was already in the town.

Barnaul<sup>3</sup> is situated on the left bank of the Ob', at the confluence with the river Barnaulka, on the left-hand side of this river, along which it extended more than along the Ob'. All the longitudinal streets of the town were parallel to the Ob'. Barnaul's factory was situated on a weir of the river Barnaulka, dammed into an extensive and beautiful pond. The right bank of the river rose high and rather picturesquely above its mill-pond; on it a cemetery chapel was being built.

<sup>1</sup> Berdskoe, founded in the early eighteenth century as a defence against Kalmyk and Kirgiz raids, subsequently developed into a prosperous trading village with a population of more than 2,500. Situated on the right bank of the river Ob', it possessed a telegraph station, school, church and *kumys*-cure institution. Apart from its smithies, 20 commercial enterprises dealt mainly in alcoholic spirits, manufactured goods, grain and agricultural equipment. Its annual Mikhailovskaia fair was held in November. V. P. Semenov, *Zapadnaia Sibir'*, pp. 476-7.

<sup>2</sup> Salair ridge, a branch of the Kuznetsk Ala-tau stretching some 320 km but rarely exceeding 500 metres in altitude, is rich in minerals, including coal, gold, silver-lead, zinc, copper, iron and siderite. Suslov, *Physical Geography*, pp. 111-13.

<sup>3</sup> Barnaul, the centre for the Altai mining district, was founded in 1771, although a factory had been set up by Demidov in 1739, and it became an *okrug* town in 1822. In the later nineteenth century it received many immigrants from the black-earth zone of European Russia. In 1838 its meteorological observatory provided evidence of the severity of the local climate, e. g. the average annual temperature recorded between 1841 and 1862 was 0.3° C, and in December 1860 the lowest recorded was minus 55°. Barnaul was one of the most busy ports on the river Ob'. Blanchard, *Russia's Age of Silver'*, *passim*; V. P. Semenov, *Zapadnaia Sibir'*, pp. 481-4.

On one of the squares rose a granite obelisk in memory of the centenary of the Altai mines;<sup>1</sup> almost the entire square was surrounded by stone government buildings, but all the private houses, in spite of the comfort and luxury in which the mining engineers lived, were wooden. At the time of my stay in Barnaul in 1856 the houses numbered up to 1,800, and the number of inhabitants exceeded 10,000 of both sexes.

I stopped in Barnaul, in accordance with the promise I had given, with V. A. Poletika, who had hospitably invited me to his place. Through him I very soon became acquainted with the whole of Barnaul society.

Although the town of Barnaul was not notable for the outward beauty of its buildings, to make up for it everything inside them was furnished with comfort and luxury, and everything seemed to be full of life. The society, which was entirely homogeneous, consisted of very well educated and cultured mining and forestry officers and their families, closely related to each other, and also of the families of two or three gold-mine owners, who were also partly mining officers at one time. They lived merrily and even luxuriously, but in their feasts there was not that coarseness which distinguished the orgies of the members of the Central Administration of Western Siberia in Omsk. The aesthetic inclinations of the mining engineers of the Altai mining region were manifest not only in the decor of their rooms and the elegant clothes of their ladies, but also in their familiarity with both scientific literature and *belles-lettres*, and finally in Barnaul's flourishing amateur theatre, which even had its own building. Many of the mining engineers, through constantly taking part in amateur productions, had made themselves into refined, well-educated actors, among whom Samoilov, a brother of the famous actor,<sup>2</sup> remains in my memory, and also Davidovich-Nashchinskii, a young mining engineer. In ladies' roles two of the wives of engineers were also quite outstanding actresses.

In a word, Barnaul at that time was indisputably the most cultured corner of Siberia, and I nicknamed it 'the Siberian Athens', leaving the *sobriquet* of 'Sparta' for Omsk. But, of course, between these towns and the ancient cities of Greece there was a difference, corresponding to the difference between the culture of Siberia in the middle of the nineteenth century and that of ancient Greece. Besides, the Siberian Sparta, for all the crudeness of its assertive morals, lacked Spartan purity and irreproachability, while the Siberian Athens had its dark sides. I will come back to a description of Barnaul life later.

<sup>1</sup> Annual output of silver exceeded 1,000 *puds* in 1769–78, 1799–1806, 1817–29 and 1851–63. Production of gold, iron and copper from Altai mines peaked in the second half of the nineteenth century. V. P. Semenov, op. cit, pp. 286 and 333–43.

<sup>2</sup> Vasilii Vasil'evich Samoilov (1813–87) is the actor referred to and he, too, was an officer educated at the Mining Institute before becoming the outstanding star of the Imperial Petersburg Theatre. His sisters Mar'ia, Nadezhda and Vera were all in the theatre at some time, but it is not clear from Semenov's text whether the brother he met was Pëtr or Sergei. A portrait of V. V. Samoilov is contained in *BSE*, 12, opposite p. 612; *B&E*, 56, pp. 216–17.

The mining superintendant of the Altai mining region, Colonel Andrei Rodionovich Gerngross,<sup>1</sup> received me very affably and not only ordered the manager of Zmeinogorsk territory to render me all possible assistance during my journeys around Altai, but also provided me with a tent, which rendered me great service throughout my travels in Altai and the Tian'-Shan'.

Getting to know Barnaul, its society, amongst whom I later had to spend the winter of 1856–7, Barnaul's mining production, with its interesting geological, palaeontological and archaeological collections, the beautiful new surveys carried out in the Altai mining district on the initiative of M. N. Murav'ev, and also the immediate preparation of my equipment took me a week and a half, and I was ready for the journey only by 19 June.

I left Barnaul that day in the morning, travelling by post-chaise, but not with the speed usual for this road, due to the stops caused by my wish to become thoroughly acquainted with the nature of the Altai country. On the first two stages my road went parallel to the course of the Ob', but further on, parallel to the river Alei, across steppes covered with splendid early summer vegetation.

We crossed the narrow Alei on 20 June very early in the morning. From the Kalmyk Capes station, situated on the river Charysh,<sup>2</sup> in the blue distance I saw the Altai mountains for the first time. To the first three 'volcanoes', which serve as foothills of the Altai, the Cossacks gave the names Vostrukha, Rechikha and Ignatikha; beyond them in the really blue distance rose Siniukha. As each of these mountains rises separately and does not present a continuous ridge, Siberians call them 'volcanoes' (*sopki*), although there is nothing volcanic about them. Moreover, Siberians say 'the volcanoes are smoking', when the hills wrap themselves up in clouds drawn towards them. Further, when Cossacks see a continuous ridge, they call it 'ural', not as a proper name, but as a common noun. It also struck me how Cossacks use the verb 'to prove', in the sense of to inform. Beyond Kalmyk Capes, on the bank of the river Loktevka I came across the first outcrops of solid Altai rock: they were grey porphyry, on the surfaces of which there grew a typical Altai plant, *patrinia* (*Patrinia rupestris*) and Altai types of stonecrop (*Sedum*).

I spent the night of 20–21 June at the Saushka station in order to devote the next day to an examination of Lake Kolyvan',<sup>3</sup> which already possessed world-

<sup>1</sup> (Andrei) Aleksander Rodionovich Gerngross was descended from a Netherlands family which had moved to Livonia in the sixteenth century. He was director of the mining department in 1855–66, while his son Nikolai (1825–1900), who had been a school friend of Semenov, became deputy Minister of State Properties.

<sup>2</sup> River Charysh, a left bank tributary of the Ob', originated as a swift rocky stream in the Charysh *belki* in the Korgon mountains, but after joining the Loktevka it became deeper and more placid, broadening to more than 180 metres. Its upper reaches were uninhabited, but below the Korgon confluence numerous villages and hamlets followed its course, which was generally navigable for small steamers as far as Beloglazovo. Kosharov no. 81.

<sup>3</sup> Kolyvan' lake, 3.7 km long and 2 km wide, is situated in a picturesque locality in Biisk *okrug* at 318 metres above sea level. Its scenery featured in several sketches by Kosharov in 1857 (nos. 79, 80, and 117).

wide fame, and which was two or three *verst*s away from the station. This lake, situated in the foothills of the Altai, always struck visiting travellers by the fantastic forms of its granite rocks, which rise vertically near and far from it in slightly hilly surroundings.

The granite rocks of Lake Kolyvan' are rivalled in their forms only by those of the Brocken mountain in the Harz.<sup>1</sup> The difference between them is that the rocks of Brocken are made up of separate granite boulders, piled one on top of the other in chaotic disorder not unlike mattresses; while the Kolyvan' rocks with their fantastic shapes have more shell-like structure. Separate rocks rise on both sides of the Barnaul road from the slightly undulating surface of feather-grass steppe, and the most fantastic are to the west of it. The rather flat bow-shaped western shore of the lake consists of the same granites. On the northern shore, at the foot of the high rocks a garden was being laid out at that time and in it was a large wooden awning or veranda, from where there was an excellent view of the lake and of the rocky promontory which juts out into it from the eastern side. Near the south-eastern corner of the lake a stream originated, apparently fed by swamps formed by water trickling out from the lake. From the southern side of the lake rises a hill about 150 metres above the lake level, and covered with a thicket of birch-trees and not too numerous fir-trees. In the waters there grows floating *chilim* (*Trapa natans*), characterized by its angular nuts. Dry-land vegetation around the lake differed little from the European; only wild Tatar honeysuckle (*Lonicera tatarica*), which migrated in vast quantities from the Altai upland to our gardens, and beautiful pale yellow *kasatika* (*Iris halophila*), decorating the banks, reminded the traveller that he was already in the heart of Asia.

From Saushka I arrived at Zmeinogorsk on 22 June and decided to devote five weeks or so to studying the Altai. During this time I visited the Zmeinogorsk and Lokot'<sup>2</sup> plants, all the mines of the Zmeinogorsk group, and those located along the systems of the rivers Uba and Ul'ba. These excursions occupied about a month. With regard to Zmeinogorsk mine I was interested in the immediate reasons for the collapse of this mine, previously the first in the Altai for the richness of its resources, and in particular in Zmeinogorsk district; and in the attitude of the Altai mining administration to the then large Russian serf mining population of Altai. I could complete such a study only having spent the winter of 1856-7 in Barnaul, and therefore I shall return to this subject later.

<sup>1</sup> Brocken is a summit in the Harz Mountains, Saxony, visited by Semenov in 1855.

<sup>2</sup> Demidov had established the first copper smelter in Altai near Kolyvan' in 1729. When it closed 70 years later, the site at Lokot' was taken over as the I. I. Polzunov factory (1802) for grinding and polishing local stone, mainly green jasper, red agate, breccia and marble. After 1821 the scale of operations was greatly expanded to meet the fashionable demand for ornamental stonework in Petersburg by famous architects such as Quarenghi and Rossi. Several outstanding examples of massive porphyry vases are now exhibited in the Hermitage museum.

Zmeinogorsk<sup>1</sup> did not appear to me to be particularly attractive. It is situated in a very hilly area, but the rocky mountains surrounding it were devoid of forest vegetation. The town consisted of plain wooden houses, but their interior decoration was distinguished by the same comfort as in Barnaul. In a word, Zmeinogorsk was the most significant cultural centre of the inner Altai. In spite of the exhaustion of the mine, exploratory work was still carried out in it, which allowed a geologist with a hammer to penetrate the underground kingdom of the Altai, where penal servitude did not exist, and moreover enormous spoil-heaps allowed me to get acquainted with all that had ever been extracted here from below the surface, not excluding even 'chudskii'<sup>2</sup> implements of the Bronze Age. In Zmeinogorsk, Cherepanovsk and other mines of the Zmeinogorsk group, and also at the Lokot' works, I received the most cordial hospitality from educated and cultured mining engineers.

But my most interesting excursion in the Altai was to the valleys of the rivers Uba and Ul'ba, and especially to the innermost and most interesting of the inhabited Altai valleys, Riddersk. My companion on this journey, Koptev, an educated and cultured officer of the corps of forest wardens,<sup>3</sup> was extremely familiar with the Altai. He was only about four years older than I and, having married a daughter of one of the Altai mining engineers, he had been widowed not long before my arrival, so he gladly went with me to travel to the Altai valleys.

We set out from Zmeinogorsk on this journey on 20 July. The road from the weir of the extensive Upper Zmeev pond went steadily uphill onto the ridge of Mokhnataia *sopka*, which consist of granite. Having reached a pass, from which could be seen the high mountains of the Kolyvan' ridge – Siniukha and Revnukha – the road descended through steppe terrain to the river Alei<sup>4</sup> along an inclined plane. From this slope at a distance of twelve *vershs*, a large village,

<sup>1</sup> Situated at 440 metres above sea level, Zmeinogorsk (Zmeev), the seat of the mining administration in Altai district, was considered an unimportant town even at the end of the nineteenth century. Rich silver-lead ores were first discovered in 1742 and were initially exploited open-cast, but pits were later dug to a depth of 230 metres. In the 1860s the annual output yielded up to 2.86 metric tonnes of silver and 196 tonnes of lead. Between 4,000 and 6,000 men were employed in the mines and auxilliary jobs. By 1891 the workforce had declined to 300 and the town's entire population was only about 6,000. V. P. Semenov, *Zapadnaia Sibir*', pp. 502–5.

<sup>2</sup> According to Dal', *Tol'kovyi slovar* (vol. 4, p. 1,369), the term *chudak* was used to refer, often in a derogatory manner, to a country person, distinctive in retaining his own customs and way of life. *Chud* or *chudskoe* also applied to material, especially antiquities, associated with a Finnic tribe. As such, it gradually relinquished a precise ethnographical meaning and in Siberia was used more generally in describing tumuli and other relics linked to the Scythians which were found in southern Siberia and southern Russia. As expressed to Semenov, the term indicates little more than 'aboriginal' or 'primitive', or 'prehistoric' in the broadest sense.

<sup>3</sup> All forestry administrators of the Altai, like the mining ones, at that time had the rank of officers and wore military uniform.

<sup>4</sup> The river Alei, a left-bank tributary of the Ob', initially flows west from the Altai foothills, then briefly to the south-east. Although over 530 km long, its maximum depth is only about 7 metres and it is not navigable.

Staro-Aleiskoe, could be seen on the silvery ribbon of the Alei. This settlement looked remarkably wealthy and prosperous, but there, instead of a church, an old rickety chapel pointed clearly enough to the fact that the thousand inhabitants of the village belonged to the Old Believers,<sup>1</sup> and that they were not allowed to erect a new grander church, such as they would have wished to build for themselves. Beyond Staro-Aleiskoe, which was nineteen *versts* from Zmeinogorsk, we forded the Alei. Its current was very fast, and its banks consisted of alluvium. The steppe beyond it was monotonous; but near the road on the left there remained rather low rocky hills, rising to a very broken crest. They consisted of granite and constituted a continuation of the Ubo-Aleisk ridge. The steppe itself, however, was undulating and crossed by gently sloping gullies. Beyond Staro-Aleiskoe, here and there in the steppe we came upon crops of wheat, spelt, oats and millet belonging to the wealthy peasants of Staro-Aleiskoe *volost*. In places we encountered *solontsy*, which could be recognized by their vegetation, consisting of *solonechnik* (*Statice gmelini*) and halophytes (*solianki*). On the Zolotushka and Griaznushka, small rivers flowing across this steppe, there were two mines: Gerikhovsk and Titovsk, but both of them, as well as the neighbouring Surgutanovsk, had been abandoned a long time ago;<sup>2</sup> there were not even any buildings there, and only in Titovsk mine was some prospecting carried out for a time by newly arrived workers. Gerikhovsk hill, when examined by me, consisted of porphyry, breccia and limestone. In the latter, to my great delight I found a multitude of fossils of the Devonian system.

The sun had already set, when, carried away by searching for fossils, I left Gerikhovsk mine in my spacious *tarantas*, in which all the treasures that I had collected fitted easily. At first we travelled upstream along the river Zolotushka, but then we turned towards the south-east across the steppe. It got dark very quickly, and soon we lost our way. We had to spend the night in the steppe. At dawn on 21 July our horses, which had been grazing on the steppe, were missing. The coachman went to look for them when day was already breaking. However, when the sun rose, it lit up a gently sloping, cupola-shaped mountain, about eight *versts* away in front of us, on the top of which buildings could be seen. According to Koptev, this was Sugatovsk mine.<sup>3</sup> With the help of my servant the

<sup>1</sup> Old Believers were a group of conservative Orthodox sects who did not accept the ecclesiastical reforms introduced in the seventeenth century. V. P. Semenov, *Zapadnaia Sibir'*, pp. 505–7; *B&E*, 51, pp. 284–303.

<sup>2</sup> According to V. P. Semenov, *op. cit.*, p. 507, silver extraction from Surgutanovsk mine began again in 1861.

<sup>3</sup> Sugatovsk mine on the river Uba in Biisk *okrug* began operating in 1851. Its annual production of over 6,500 metric tonnes of ore yielded some 2.5 tonnes of silver at a content of 3.2 to 7.5 grammes per *pud*, i.e. 0.19 to 0.45 g per kg. By the time it ceased production in the late 1880s the mine's total output had exceeded 82 tonnes of silver. It also produced between 16 and 25 tonnes of copper annually.



horses were found quite quickly, but there was no coachman, and we decided to go without him straight to Sugatovsk mine, forded the river Vavilonka and began the six-*versts* ascent, which we accomplished safely too. Sugatovsk mine was one of the wealthiest iron and silver mines of the Altai. Sugatovsk mountain consisted of porphyry, intersected by a band of pure ironstone and also containing many soft, loose ochrous ores. At that time the mine fulfilled an annual order of 250 thousand *puds* [i.e. 4095 tonnes] of ore, the content of which revealed  $1\frac{3}{4}$  *zlotnik* of silver per *pud* of ore.<sup>1</sup> From Sugatovsk mine, for a distance of twelve *versts*, the road went down towards the river Uba, which here had already come out of a mountain valley and was flowing freely between quite low, but steep, banks with a fairly fast and wide course. Three *versts* after ferrying across it, we found the surviving settlement of Nikolaevsk mine,<sup>2</sup> although the mine no longer operated, and only prospecting was carried out in it.

The country around Nikolaevsk mine was still steppe. Eight *versts* on from Nikolaevsk mine we came out through the steppe to the Uba, facing Shemonaikha,<sup>3</sup> a large and prosperous village situated on the right bank of the Uba, just at its exit from the mountain valley into the steppe. Beyond the Uba there rose a mountain which, judging by its broken profile, undoubtedly consisted of granite. From Shemonaikha to Vydrikha, for twenty *versts* the road now went up along the Uba valley, bordered on both sides by granite mountains. Beyond Vydrikha the road began to move away from the Uba and to climb the mountain rapidly. Several *versts* before the next station Losikha, twenty *versts* distant from Vydrikha, there suddenly emerged a fascinating view of the Uba valley, broadening here into a hollow, in the middle of which meandered the wide ribbon of the majestic river and a large village extended, descending into the hollow from the foot of a porphyry hill. Our descent from the granite mountains was long and steep, along an inclined plain with a sharp gradient, past a deep ravine. The entire slope was overgrown with luxuriant vegetation of unusually tall steppe grasses, among which stood out the beautiful large pink flowers of *khat'ma* (*Lavatera thuringiaca*) and slender wild hollyhock (*Althaea ficifolia*), thick fascicles of feather-grass (*Stipa capillata*) and large drooping floscules of thistle (*Cnicus cernuus*). The lower part was overgrown with thick bushes, among which the characteristic Altai spurge-laurel (*Daphne altaica*) filled the air with the fragrance of its white-pink flowers. Beyond the wide hollow, the descent to

<sup>1</sup> At this concentration the silver content of the ore was 7.47 grammes per *pud*, i.e. 0.46 g per kg.

<sup>2</sup> Nikolaevsk mine opened in 1749 on the site of prehistoric workings in which stone and copper tools were discovered at a depth of more than 20 metres. Having closed in 1752, it re-opened in 1771 for only four years and had been abandoned by the end of the century.

<sup>3</sup> Shemonaeuskoe on the river Uba was settled by Poles in the seventeenth century and in 1897 had a population of 3,600, still retaining its Old Believers' church. It also had a parish school, several shops or stalls and three tanneries.

which vividly reminded me, albeit in not such a grandiose appearance, of one of the descents into the Valais valley of the Upper Rhone (Descente de Forclas), in the distance arose the high Ubinskíe *belki*, on the highest of which glistened patches of snow.

While descending to the valley a catastrophe almost befell us; the lively Siberian *troika* harnessed to our heavy *tarantas*, bolted downhill on the steepest part of the slope, and there did not seem to be any chance of holding it back. At this juncture I was enthusiastically recounting to Al. Borisovich Koptev my recollections of the Valais valley, and noticing that my fellow-traveller was looking around with unease, choosing this moment to jump out of the carriage, I continued my story absolutely calmly, thereby taking up that critical moment when the horses, having deviated from the road, were tearing along in the direction of the steep precipice. There was no chance of stopping them, but the resourceful coachman, gathering his strength, turned them sharply to one side, and, becoming enmeshed in the bushes, they fell down, while the carriage, whose wheels were entwined by tall grass, came to a halt.

Reaching Losikha,<sup>1</sup> I made an excursion on horseback to Losikha copper mine, four *versts* from the village, in the hope of finding there fossils, familiar to me from the Barnaul museum. But I failed to find them. I just inspected the mine and returned to the village, whence, having repaired our *tarantas*, we continued our journey.

At the twelfth *versta* along the road from Losikha to Sekisovka a very beautiful panorama opened up. In front of us there appeared a mountain with a saddle-like top, which differed from all the Altai mountains seen by us hitherto in that the saddle, named Prokhodnoi *belok*, was covered by an extensive and dense pine forest. To the left of us there rose up the majestic Ubinskíe *belki* with their patches of snow, partly concealed by a pall of cloud. At the foot of Belousovka mountain in a pine forest along the river Sekisovka running down from it, was situated a large village of the same name with a freshly white-painted wooden church. On entering Sekisovka<sup>2</sup> I was struck by some peculiarities in the clothes and dwellings of the inhabitants of this village. The women's head-dresses consisted of low *kokoshniki*, gracefully wrapped in a light white fillet, which gave the whole head-dress the appearance of a turban; their blouses and woollen skirts were beautifully embroidered with red cords. The interiors of their dwellings were distinguished by their remarkable cleanliness; the unpainted wooden floors were thoroughly scrubbed. The furniture, especially the cupboards, as well as the ceilings and walls were painted in bright colours. The inhabitants of Sekisovka were called 'Poles' (*'poliaki'*), though they spoke only Russian and were Old

<sup>1</sup> Losikha, otherwise known as Verkh'-Ubinskoe, 423 km from Biisk, had decayed to a village of about 500 houses and a population of 2,272 by 1897.

<sup>2</sup> At the end of the nineteenth century Sekisovka (Sekisovo) had a population of more than 2,000 and was famous for its beekeeping.

Believers, who had fled to Poland as long ago as the time of the Patriarch Nikon,<sup>1</sup> but returned to Russia after the first Partition of Poland<sup>2</sup> and were exiled here by Catherine II.

Between the Sekisovka and Bobrovka stations we finally crossed the watershed between the Uba and the Ul'ba, whence in the blue distance to the south-west one could see the triple-headed Monastyr' *sopka*, which lay beyond the Irtysh. Bobrovka was a large village, consisting of small white, clay-walled cottages of south Russian type, totally different from the Old Believers' type, which is explained by the fact that Bobrovka was settled by Cossacks and as far back as the beginning of the nineteenth century was a Cossack outpost. After Bobrovka it soon got dark, and for the last ten *versts* we travelled in total darkness as far as the village of Tarkhanskoe, where we spent the night.

Tarkhanskoe is situated on the right bank of the Ul'ba, in its fascinating valley, to examine which I used all of the next day (22 July). Very early in the morning, I left on horseback on my excursion, the goal of which was Dolgaia mountain, the nearest to the valley. Its slope was covered with the luxuriant grassy vegetation of the Altai valleys. The gigantic grasses were so tall that a rider on horseback, going along a narrow track, wallowed in them up to his waist. The morning dew was so heavy that it fell on me from the grass like rain, and in spite of the sunshine and cloudless sky, before reaching the top I got, as the saying goes, drenched to the bone. The herbaceous vegetation consisted of tall cereals (Gramineae), Umbelliferae, Malvaceae, Compositae, and bluebells (Campanulaceae). This mass of gigantic plants was brightened by the varied and rather bright colours of their luxuriant flowers. Just before the mountain tops, these grasses were replaced at first by bushes, and then by low turf, and at last there appeared outcrops of solid rock, namely schists, with a steep inclination of their strata (up to 70°).

From the mountain top a picturesque view opened out. The extensive valley was beautified by the broad silvery ribbon of the Ul'ba; on both its sides there arose mountain ridges, widely covered by a dark cloak of forests, and behind these mountains were visible here and there the Ul'binskie *belki*, adorned with sparkling white patches of snow. Only on one side, the south-western, the valley, broadening, disappeared in the undulating infinite Pri-Irtysh steppe, beyond which on the remote horizon in the foggy distance rose the three-headed Monastyr' *sopka*.

Having reached the crest of Dolgaia mountain, I crossed to its other flank and descended to the side valley of a quite small tributary of the Ul'ba, along which I

<sup>1</sup> Previously Archimandrite of the Novospasskii monastery and Metropolitan of Novgorod, Nikon (1605–81) became Patriarch of Moscow and all Russia in 1652. In the 1640s he had supported Tsar Aleksei Mikhailovich, but from 1658 found himself at odds with the sovereign and was formally deposed by an Ecclesiastical Council in 1666–7. His persecution of national-traditionalist Old Believers led to the schism in the Orthodox community in Russia. *B&E*, 41, pp. 138–42; Florinsky, *Russia*, pp. 286–95.

<sup>2</sup> The First Partition of Poland between Russia and Prussia took place in 1772.

came out again to the Ul'ba and returned to Tarkhanskoe. On this descent I found, to my great pleasure, what was the main purpose of my whole excursion: rock outcrops of the Carboniferous system, rich in fossils and affording me plentiful booty.

Next day, 23 July, we continued our journey to Riddersk. We had been warned while still in Zmeinogorsk that this last part of the journey would be difficult, as the Ul'ba, where it is formed from its component branches, had eroded and carried away a well-built road and bridges, causing great devastation. That is why the mining authorities took special measures in order to make our journey to Riddersk quite safe. Our *tarantas* was harnessed to six horses in tandem, and independent of the postilion we were accompanied by six horsemen. Not far from the village we forded the fast Ul'ba, which had carried away the bridge and scattered huge rocks freely around the entire valley. However, in spite of the devastation created by the wilful river, its valley between the mountains Dolgaia and Shipitsynskaia resembled a blossoming park. Its arboreal vegetation consisted of slender Siberian poplars (*Populus laurifolia*), birch, willow, aspen, bird-cherry trees, and so on. Groups of trees alternated with glades and thickets of bushes of Siberian species. Amidst the tall grasses I noticed here many paeonies (*Paeonia hybrida*), which had, unfortunately, already shed their blossoms, but displayed the yawning deep purple interiors of their pistils. With each turn of the road new landscapes appeared before us in all their beauty. Continually we either forded the Ul'ba's branches or the mountain springs which fell into it, or ascended low porphyry cliffs, covered with luxuriant vegetation. Especially picturesque were the views from some of these eminences of the river's bends and the cliffs overhanging it in some places; to the right of us there could be seen a mountain which rose hundreds of metres above the river level. By its high sharply-angled crest it was possible to conclude undeniably that it consisted of granite; the local inhabitants gave it the scarcely poetic, but characteristic, name of Ugloukha. Its slopes were thickly covered with forest.

At the twentieth *versta* from Shemonai Kha, having crossed the Ul'ba by a deep ford, we reached the extensive village of Cheremshanka, situated at the very foot of Ugloukha. Not changing our grandiose team here, we travelled for twelve *versts* further to the village of Butachikha, over the most dangerous part of our route, because it was just here that a man-made structure, consisting of huge stone slabs and extending for almost ten *versts*, had been destroyed by exceptional floods. Such constructions here are called *rezh'*. This *rezh'* was destroyed in the spring of 1856, and the river scattered the huge rocks, of which the *rezh'* was made, throughout the valley.

Butachikha was quite a large village, extending picturesquely across the valley, and situated not far from that locality where the Ul'ba was formed from the confluence of its constituent branches. The most interesting of them was a tumultuous, fast and foaming mountain torrent, which originated from the

snows of the Ul'binskie *belki* and which was called Gromotukha by the local inhabitants. Evening was already drawing on when we left Butachikha, but it was not yet completely dark when at last we reached Riddersk, where we met with the most cordial hospitality at the house of an educated mining engineer of the Riddersk mine.<sup>1</sup>

During my travels through the Altai, as well as during my journey across the Ishim and Barabinsk steppes, I was interested to a high degree in how the Russian population was installed and settled on their arrival in a country or locality which was being occupied by them for the first time. It goes without saying that these kinds of observations are especially important in Siberia, a country where the process of colonization has not ceased even now.

There is no doubt that the whole process of installing and settling the Russian population is at the mercy of, and directly dependent on, not only the qualities of those migrating, but also even more on the local conditions of the country to which resettlement is directed. First and foremost, I was interested in the question: how were the original Siberian migrants settled, individually on isolated farms (*khutora*), or more or less compactly, that is in large settlements? This question was easily solved in terrain like the Ishim steppe. Here, as also in most parts of the black-earth, dry continental area of European Russia, it is impossible to live in interfluvial regions due to the absence of water, and hence it is only possible to settle on the banks of rivers and fresh-water lakes. Besides, all the southern zone of Siberia, contiguous with the Kirgiz hordes, was so little protected from raids by nomads in the eighteenth century that the rural economy of a dispersed population was not guaranteed against ruin, and Russians had to settle in large settlements. Therefore, even today in Ishim *uezd*, since the time of the occupation of this country by Russian populations, very small settlements have not existed: the conditions of the nature and history of the country prevented development of *khutora* or isolated arable fields here.

Migrants in the Altai found different conditions. Here nature, rich in water and building materials, nowhere hindered settlement and encouraged the development of isolated farms; but, in spite of this, the immigrants, who began settling in Altai from the beginning of the second quarter of the eighteenth century, established quite large settlements (from fifteen to thirty farmsteads).<sup>2</sup>

This depended on the fact that at the time of the original installation of migrants, who had come here from afar, the struggle against the wild forces of nature was beyond the strength of individual settlers and made them unite into more or less substantial villages, both for exploitation of local resources and for self-defence against neighbouring nomads and itinerant non-Russians. It was

<sup>1</sup> Riddersk mines opened in 1776, but were abandoned in 1862. Lonsdale, 'Siberian Industry', pp. 479-93; Blanchard, *Russia's Age of Silver*, *passim*.

<sup>2</sup> Lipinskii, *Russkoe naselenie*, chapter 1.

made easier by the fact that the first Russian immigrants to the Altai in the eighteenth and nineteenth centuries, for example, Old Believers and Cossacks, had already formed strong communities at the places of their former residence in European Russia or in the Urals.

The first act in the installation of immigrants in newly-occupied country consisted of building (in places where it was permitted by the presence of water and building materials, namely timber or at least clay) a more or less compact village; its enclosure with an extensive fence, which marked common land-ownership as the first necessity: common pasture (*poskotina*) was designated, and then the concentration on this pasture of domestic livestock, which was the item most valuable to them and most necessary for securing their existence, and which was thus protected from the raids of wild animals and semi-wild nomads. Only from the second year of his installation did a migrant get down to work the land, appropriating for himself as much as he could cultivate from the general mass of land, taken up by his colonization by means of unimpeded seizure. He cleared it from thickets of vegetation (forest, scrub and grass) for sowing. All the countrymen treated his clearing rights with respect, and since nobody disputed these rights, there was no need for the immigrant, for the time being, to take up new lands in order to make a *khutor*. He continued to live in his farmstead and in his village until such time as he relinquished his impoverished arable land and acquired a *khutor* (*zaimka*) in a fresh place only when he did not find land for a new clearing nearby, and when, in order to make one, he had to move, albeit temporarily, to a new place. In this way *zaimki* sprang up and were colonized, but not sooner than several years after the original settling of the country or locality. However, such secondary migrations were caused not solely by economic considerations, but sometimes had the purpose of escaping from religious and other oppression, as happened in Altai with the flight of the Old Believers 'beyond the stone', that is across the mountain ridge to the basin of the river Bukhtarma.

The Altai settlements which I visited in 1856 still preserved their original large dimensions up to the middle of the nineteenth century and did not break up into *khutora*. It was even less possible for large settlements to fragment along the Great Siberian Highway and in the Ishim steppe, just as in the black-earth area of Russia, where nature itself does not permit settlement of inhabitants in small *khutora* on less large holdings, which, however, is possible not only throughout the *poles'e*<sup>1</sup> of European Russia, beginning from Novgorodian Rus' and the Moscow industrial region to Viatka and Perm' provinces, but also in our Far East, beyond Baikal and as far as the Sea of Japan.

I now return to continue my narrative. On 25 July, on the second day after our arrival in Riddersk, Koptev and I undertook an ascent of Ivanovskii *belok*. At dawn we left by carriage to the place where the river Gromotukha issues from its

<sup>1</sup> Shcherbakov, 'Factors of Swamp Formation', pp. 26–30; Kovalev, *Sel'skoe rasselenie*, pp. 159–65.

wild gorge into the valley, in which, merging with the river Tikhaia, it forms the Ul'ba. Here we changed to saddle-horses, which were waiting for us with the guides.

The first rise was very abrupt. At a distance of approximately 250 metres above the valley, on the steep, treeless slopes I came upon plants of the wonderful Altai alpine flora for the first time. These were large golden-yellow flowers of the Altai alpine poppy (*Papaver nudicaule*), blue *gorechavki* (*Gentiana procumbens*) and deep purple flowers of saxifrage (*Saxifraga crassifolia*), the large round leaves of which are used by the local inhabitants as a substitute for tea with the name of 'koporski' tea.

When we reached a wooded crest, our ascent became less steep, but the forest became hardly passable. Felled trees were lying across the path, which disappeared in thick undergrowth. Even in the glades, grasses and bushes reached the waist of a rider, but they were European types of plants. Ascending a further 130 to 150 metres, birch-trees disappeared, and the forest became entirely coniferous: larch and Siberian cedar joined the fir- and pine-trees. In those places where we came across steep slopes, bare of any forest vegetation, they were covered by alpine grasses of Altai flora: including pale lilac *vodosbor* (*Aquilegia glandulosa*), pale yellow *mytnik* (*Pedicularis*), bright yellow flax (*Linum sibiricum*) and yellow onion (*Allium flavum*), blue *zmeegolovnik* (*Dracocephalum altaicense* and *Dr. grandiflorum*), Altai types of *smolevka* (*Silene*) and *volodushki* (*Bupleurum*), and some European types of orchids (*Gymnadenia conopsea*, *Coeloglossum viride*) and others.

Higher still, another 150 metres up, the larches and fir-trees started to disappear, and even the pines were covered with needles only on their western and north-western sides, while on the south-east side, under the influence of dry continental winds, they were completely bare. Yet higher, the pines lost the character of trees and turned into a dwarf creeper, in the glades between which there appeared Altai forms of high alpine character: dwarffish with large, mostly bright flowers. These were pink flowers of dryads (*Dryas octopetala*), which covered the cliffs, and blue flowers of *gorechavka* (*Gentiana altaica*, *pratensis*, *glacialis*, *silvestris* and *obtusa*), among which the most slender and delicate, *Gentiana glacialis*, protruded from fissures in the rocks. In the same clefts there nestled white and yellow *kamnelomka* (*Saxifraga*), *patrinia* (*Patrinia rupestris*) and many Compositae: *melkolepestnik* (*Erigeron alpinum*), *gor'kusha* (*Saussurea pygmaea* and *S. pycnocephala*) and the white fluffy stars of 'poreznaia grass' (*Edelweiss*, *Leontopodium alpinum*).

At last, having made a long arc around the top of Ivanovskii *belok* from the southern side, we climbed onto it. The rather large area which forms this summit consists of a multitude of flat granite rocks. The view from the edge of this area was very extensive and magnificent. Behind, the wild gorge of the Gromotukha was closed by the ridge of the Ul'binskie *belki*, among which Prokhodnoi and

Rassipnoi attracted special attention. In front, the Turgusunskie *belki* were visible, and to the left across the Riddersk valley in its striking blue colour, in the distance were Ridderskaia Siniukha and the Ubinskie *belki*; unfortunately, many of the mountains were wrapped in clouds at that time. Everywhere on the northern slopes of the mountain tops wide strips and patches of snow were visible, but a continuous snow cover, as on the Altai Belukha or on the Tian'-Shan', was not to be seen on any of these *belki*.

No sooner had we climbed to the top of Ivanovskii *belok* than a strong wind carried a cloud upon us, which covered us with a veil of thick fog. At the edge of the summit we found a table, placed there by the famous botanist Ledebour<sup>1</sup> on the spot where he took his measurements. The bad weather which had set in prevented us from taking a hypsometric measurement. The temperature dropped to 4° R, while in Riddersk it had been 14°.

Having spent about an hour on the summit, now in impenetrable fog we began to descend along the steep north-western granite slope, on which, beside the wide snow strips, there were luxuriantly blossoming tall alpine grasses: pink *cortuza* (*Cortusa matthioli*) and delicate-white *vetrenitsa* (*Anemone narcissiflora*), *Cladonia acutifolia*, *ochirok* (*Sedum elongatum*), *Gymnandra altaica*, *gorechavki* (*Gentiana altaica* and *G. glacialis*) and other distinctively Altai and alpine plants.

A westerly wind was blowing with unusual strength and, beginning from the middle of our descent, pelting rain and hail had started to pour, so that when in about two hours we came to the exit of the Gromotukha from its gorge and sat in the carriage, we were drenched to the skin.

Next day I inspected the Riddersk mines underground, but the weather turned bad, and that, and the fact that I was quite unwell, due to a cold, forced me to abandon my initial intention of crossing the Prokhdnoi *belok* to the valley of the Charysh. On 27 July I left Riddersk, having also visited the Uba valley, and by the evening of 30 July I had returned to Zmeinogorsk, where I quickly prepared for my departure via Semipalatinsk to the fulfilment of my cherished and secret dream – reaching the 'Tian'-Shan'.

On 1 August I left Zmeinogorsk and spent two days (2 and 3 August) examining again the south-western foothills of the Altai near the Nikolaevsk and Sugatovsk mines.

On 4 August I left Nikolaevsk, three *verst*s from which I crossed the river Uba by the ford which was familiar to me. On the opposite, right bank of the river

<sup>1</sup> Karl Friedrich von Ledebour (1785–1851), a German botanist, was born in Stralsund, and studied natural science in Greifswald, Pomerania. In 1805 Ledebour became Director of the Botanical Gardens at Dorpat (Iur'ev) and from 1811 to 1836 was Professor of Botany at its University. His travels in Altai were undertaken in 1826. He was best known for his 4-volume *Flora Rossica* (Stuttgart, 1842–53), while his Russian travels also resulted in *Reise durch Altai-Gebirge* (Berlin, 1829–30) and *Flora Altaica* (Berlin, 1829–33).



there arose a rocky mountain, which consisted of fine-grained dark green diabase (*griunshstein*). This mountain is the last of those which follow the course of the Uba, which further on flows across the steppe towards the Irtysh. Fifteen *versts* from the crossing we reached the village of Krasnoiarskaia, the last settlement of the Altai mining district, its name being taken from a huge reddish sand cliff which extends in an arc along the right bank of the Uba. All around, wherever one's gaze fell, it met the boundless steppe, and only the village itself was shielded by a few willows. The vegetation of the steppe was rather monotonous; among it there tediously predominated feather-grass (*Stipa capillata*), Labiatae (*medovik*, *Phlomis tuberosa*), small bushes of meadow-sweet (*Spiraea crenata*), and others. On the horizon in the blue mist, beyond the Irtysh, mountains were visible. The road from Krasnoiarskaia village went at first for eight *versts* along the river Uba, on the banks of which bushes – honeysuckle (*Lonicera*) and sweetbrier (*Rosa soongarica*) – were growing; then it went up to a low plateau and after twenty-six *versts* reached the first Cossack settlement on the Irtysh, P'ianogorsk. Slightly further than half-way an undulating descent towards the Irtysh began. On the gently sloping inclinations of this descent piles of stones of dazzling whiteness caught my attention. They were large fragments of white quartz, thrown about here, obviously, by a human hand. According to the testimony of the natives, these were old Kirgiz cemeteries.<sup>1</sup> Ahead of us the Irtysh displayed its silvery stream, and beside it extended the old P'ianogorsk outpost with its pretty little white houses. The steppe, which extended on all sides, was very sandy, and this affected its flora, in which there appeared typical plants of the sands: *volosnets* (*Elymus arenarius*), cudweed (*Helichrysum arenarium*), liquorice (*Glycyrrhiza echinata*), scabious (*Scabiosa ochroleuca*), some species of wormwood (*Artemisia*), and even some *solianka* (*Salsolaceae*).

About four *versts* beyond the Irtysh there arose the mountain Dzhaman-tash (Evil stone), in the saddle of which the *iurty* of a Kirgiz camp were visible. Near the outpost we came across extensive plantations of tobacco. Beyond P'ianogorsk our track now went along the Irtysh line of Cossack outposts. The next outpost after P'ianogorsk, Shul'binsk, was twenty-five *versts* from it. Half-way between the two outposts I noticed granite rocks, rising about six metres above the level of an arm of the Irtysh, which was near the road, and washed by its waters. The granite was extraordinarily coarse-grained: pale pink feldspar and silvery white mica, which were part of it, gave it a light appearance. If these rocks had not been washed by the waves of the Irtysh floods, they would have been hidden by the very thick sand deposits, which were filled with small and large boulders. The largest of these boulders consisted of black amphibolite. The vegetation here was more diverse than on the steppe watershed. On this interesting locality the extensive Shul'binsk pine forest abutted from the north-east side. The river Shul'ba

<sup>1</sup> Quartz crystals are known to have been used to decorate burial places throughout Europe since prehistoric times.

itself we crossed by a ford without any difficulties, at a distance of about two *versts* from Shul'binsk outpost.

Since quicksands extended along the right bank of the Irtysh between the Shul'binsk outpost and the next one, Talitsa, for the entire distance of twenty-five *versts*, to avoid a difficult passage over them we had to cross to the left bank of the Irtysh, more than 600 metres wide here, and to travel along this bank, which was overgrown with aspen, silvery poplar and willow, and also with bird-cherry trees and Tatar honeysuckle. All the way along to Talitsa outpost the surroundings were very picturesque and resembled a natural garden, adorned with the broad silvery ribbon of the Irtysh, as it wound between banks and islands, beautifully covered with tall trees. On the other side of the river could be seen the Shul'binsk pine-forest, descending from afar along an inclined plane towards the Irtysh. Having reached the confluence of the steppe river Char-gurban with the Irtysh on its left bank (twenty *versts* from Shul'binsk outpost), we returned to the right bank to Talitsa outpost, and having covered one more stage (twenty-four *versts*) that day, at dusk we reached Ozernyi outpost, where we spent the night, and next day, on 5 August, at day-break we arrived in Semipalatinsk.

## CHAPTER 2

### First Journey in the Tian'-Shan'

*Semipalatinsk. Meeting with F. M. Dostoevskii. Journey to the south. Aiaguz. Lepsinsk outpost. Semirechensk Alatau. Arasan. Kopal. Colonel Abakumov. Cholokazaks. Alaman Range. The river Ili. Fort Vernoe. Zailiiskii Alatau. A view of the Tian'-Shan'. Lake Issyk-kul'. The river Chu. Buam gorge. The Karakirgiz. Return to Vernoe. A visit to Kul'dzha. Return to Semipalatinsk via Kopal. Second meeting with F. M. Dostoevskii. Return to Barnaul.*

I had intended to stay only twenty-four hours in Semipalatinsk, where I had no business except visiting the Governor, as I had been recommended to him by the Governor-general, and where the town, as well as its immediate environs, did not present any interest to me. However, I met with the most obliging reception on the part of Governor Panov, a major-general of the headquarters staff, who, being warned of my arrival, sent out to meet me his adjutant, Demchinskii, a brilliant army officer, who kindly invited me to stay at his place, as there were no hotels in Semipalatinsk in those days. But most of all Demchinskii made me happy by a delicately arranged surprise: in his apartment he presented to me quite unexpectedly, dressed in a soldier's greatcoat, my dear Petersburg friend, Fedor Mikhailovich Dostoevskii<sup>1</sup> whom I was the first of his Petersburg friends to see after he left the 'house of the dead'. Dostoevskii quickly told me about everything he had had to endure since the time of his exile. Among other things, he informed me that he considered his situation in Semipalatinsk quite tolerable, owing to the kind attitude towards him not only of his direct superior, the battalion commander, but also of all the Semipalatinsk administration. However, the Governor considered it to be awkward for him to receive as his acquaintance an officer reduced to the ranks, but did not object to his adjutant being on almost friendly terms with him. It should be noted that in Siberia the authorities generally took a relaxed attitude to exiles who were already set free, or persons

<sup>1</sup> Dostoevskii was released from penal servitude in Omsk on 15 February 1854, but was obliged to serve in the Siberian Army Corps for an indefinite period. He moved to Semipalatinsk in March 1854. Frank, *Years of Ordeal*, pp. 175-92.

under surveillance. Thus, an *habitué* at General Panov's, a member of his regular evening whist party, was a physician, who also took care of the Governor's poor health. When the coronation manifesto of Alexander II was published, Panov was informed officially that police surveillance was lifted from this physician, who thanks to his commendation had attained the rank of State Councillor.<sup>1</sup> The Governor learned of the existence of this surveillance for the first time on this occasion, thinking, as he said to me jokingly, that since his appointment as governor, it was not the physician who was under his surveillance, but, on the contrary, he was under the physician's surveillance.

Fedor Mikhailovich Dostoevskii offered me hope that on my way back he would arrange to visit me at my winter quarters in Barnaul, settling the details with me by letter beforehand.

Having left Semipalatinsk on 6 August, I set out in my *tarantas* along the post picket road for the town of Kopal. At that time travellers could not travel along this road other than with an escort of two to five Cossacks. Relay stations along the road consisted of small houses of unbaked brick, built in the steppe at a distance of twenty-five to thirty-five *versts* from each other, and occupied by a picket of twelve Cossacks. At these stations not many horses were kept, and in case of need they were taken directly from the herds of Kirgiz who were leading a nomadic life nearby. Caught in the herd, a *troika*, which had never seen any harness, was harnessed so that the horses had their eyes blind-folded and were put facing the *tarantas*, and were only later turned the proper way around, and when everything was ready the blindfolds were taken off their eyes and the whole team was sent off along the road. The horses tore along over the steppe like mad. The Cossack coachman did not try to hold them back, but Cossacks on horseback sped along on both sides of the *tarantas* and only kept the *troika* off dangerous places, keeping to the general direction. Having rushed for about ten *versts* in this manner, the horses, becoming tired, trotted more evenly and calmly, and were easy to manage.

Thus, on 6 August, around midday, Demchinskii and I came to the Irtysh crossing, where my *tarantas*, which had already gone through customs examination, was awaiting us, and where we were met by F. M. Dostoevskii. The crossing was rather protracted, because in summer there were two crossings instead of one; one across the Semipalatinsk branch of the Irtysh, and the other across the Irtysh itself.<sup>2</sup> Having negotiated both crossings, I said good-bye to my old and new friends, receiving sincere wishes for good luck from them, and got into my *tarantas*, which set forth, accompanied by four escorts. From across the Irtysh the

<sup>1</sup> State Councillor (*statskii sovetnik*) was the fifth civilian class in the Table of Ranks; it carried hereditary gentry status. Smith, *Russian-English Dictionary*, pp. 482-4.

<sup>2</sup> Kosharov nos. 78 and 83. Since these sketches were of locations visited before Semenov met Kosharov it is not known precisely when, or indeed by whom, they were drawn. If not specially commissioned from Kosharov, it is possible that they were made by Semenov himself.

view of Semipalatinsk<sup>1</sup> was more attractive than the interior of the town, which consisted of unsightly wooden houses and stretched along the river bank. To the right, the sharp points of five or six ugly wooden minarets projected; to the left, there arose the best of the town's stone buildings existing at that time: a white, stone hospital and the only Orthodox church, made of brick. Further to the left along the bank there stretched a long Cossack settlement, which consisted of plain wooden houses, the same as in the town. At that time (in 1856) there were less than 9,000 inhabitants in the town; by the end of the century their number had quadrupled to 35,000. At that time there were no plantations of trees either. The entire part of town on the left bank of the Irtysh, sandy and dusty, had the look of an absolute desert, and only on the islands tall trees, aspens and poplars, could be seen.

The terrain between the Irtysh and Uluguz picket (twenty-six *versts*), the first on my way, had the character of semi-desert. Here the soil was sandy with pebbles; the unusually sparse vegetation consisted of feather-grass (*Stipa capillata*) and wormwood (a few types of *Artemisia*), but there appeared already some typical, purely Asiatic plants, especially halophytes (*solianki*).

Generally, however, the Kirgiz steppe in Semipalatinsk and Semirech'e regions turned out to be totally unlike either the Ishim and Barabinsk, or the southern Russian steppes. This year at least the Kirgiz steppe was not yet burned brown at the beginning of August, and its vegetation remained in the full glory of its blossoming herbaceous plants, among which there predominated purely Central Asian steppe forms with a total absence of any trees. By contrast in the Kirgiz steppe one came across more or less extensive salines (*solonchaki*) with their distinctive vegetation. Sometimes there arose real, if small, mountain groups and ridges, consisting mainly of porphyries and also covered with steppe vegetation. At the foot of these mountains springs and small water sources sometimes broke through, but I did not encounter any running water across the large area from the Irtysh itself to the river Aiaguz.

Along my way the first mountain ridge, which broke the whole horizon like a low, rather monotonous wall, was the Arkalyk range, extending from east to west, about sixty *versts* away from the Irtysh. Already within about four *versts* of Arkalyk picket, I entered a mountain gorge, consisting of siliceous schist, uplifted by green porphyry (*Grünstein*) or diabase.

Having driven for about thirty *versts* beyond Arkalyk, only late in the evening on 6 August I reached the fifth picket on my way, Arkat, and spent the night there

<sup>1</sup> Russian Semipalatinsk originated as a fort in 1718 at 360 metres above sea level on the right bank of the river Irtysh near its confluence with the Semipalatinka stream. The settlement's administrative status changed several times between 1745 and 1854, before eventually being designated an *oblast'* town. In 1890 it had 2,500 households and its population numbered 26,353, including 3,817 'Kirgiz', i. e. Kazakhs. In the surrounding *uezd* Kazakhs constituted 92% of the total population and were still overwhelmingly nomadic pastoralists, although over 7,000 passports were granted annually to those seeking seasonal industrial work elsewhere.

in my *tarantas*, with the intention of examining the mountains near the picket the next morning. The night was cool; by morning it was only 7°C. Arkat picket was situated to the right of the road, at the foot of a little hill, and half-surrounded by granite mountains, which, albeit not particularly high, were very distinctly outlined, gathered into two groups. One of them to the west of the picket was called Arkat; the other, to the south-west, was called Burkat, the latter consisting of a small oblong ridge, of most remarkable granite peaks, more or less resembling pointed caps or hats. I found these romantic rocks to consist of coarse-grained granite with mattress-like structure, as at Lake Kolyvan' or on Brocken in the Harz, but piled in disorder, like heaps of baggage packs, and sometimes hanging over precipices in barely stable equilibrium. Sometimes, scraggy pine trees could be encountered on them. I clambered up the Arkat mountains on horseback, and up the highest rocks on foot, clutching at bushes. Their height, determined hypsometrically, did not exceed 800 metres. The mountains on the left-hand side of the Kopal road (south-east from the picket) had a completely different composition. I found that their peaks consisted of steatite, overlying violet porphyry on the north-eastern side. At the foot of these mountains was a salt lake, which dried out in summer; along its muddy edge were growing naiads (*Potamogeton perfoliatus*) and some types of *solianka* (for instance, *Statice caspia* and *St. suffruticosa*), but there were no fish in it. By contrast about thirty *versts* to the east of the Arkat there was a lake rich in fish and that was why it had the name of Balyk-kul'.

The granite Arkat and Burkat mountains with their sharp profiles constituted an exception on my journey to Semirech'e territory. Along the next five stages to the town of Aiaguz (118 *versts*) the mountains had dome-shaped forms and rounded outlines, which characterize upheavals of porphyry. Such dome-shaped mountains were especially noticeable between Usunbulak and Ingrekeevka pickets. Here the entire stage was through hilly terrain. These mountains had the name of Ingrekei and were supported by green porphyry (diabases). After the Ingrekeevka picket towards Altyn-kalat the steppe becomes more even. About six *versts* after the Altyn-kalat picket our road crossed the bed of a dried-up river, which the Cossacks called the Gor'kaia ('bitter'). This waterless river, the first I met, at a distance of 220 *versts* from the Irtysh, was the Ashchi-su or Chaganka, a left-bank tributary of the Irtysh. The upper reaches of the Ashchi-su are in the Chingistau range, the jagged crest of which showed up blue far from the Altyn-kalat picket. The last stage of the journey from Altyn-kalat to Aiaguz (thirty *versts*) I made late in the evening of 7 August, as the sun had already set when I left Altyn-kalat. The evening glow had disappeared, the night was warm and magnificent; the stars were shining distinctly on the cloudless horizon, but with a quiet and even, as if dry, lustre, and not twinkling with multicoloured lights, as in the cloudless sky in Italy. That is why they seemed to be very small. In the east, following a light glow, the moon was rising. It seemed so small on the horizon, as

though it was at its zenith, its disk sharply outlined, its light bright: all of this displayed the unusual dryness of the air; there was not a trace of dew.

I arrived in Aiaguz already after ten o'clock in the evening, having covered two hundred and seventy *versts* across typical Kirgiz steppe.

This traverse broadened to a considerable degree my concept of what the Russian people included under the term 'steppe'. Born in the vicinity of the Russian black-earth steppe near the Don and the Volga, in that outlying district of black-earth Russia, for which Russian terminology invented the name of 'forest-steppe', I became accustomed to understand by the name of steppe extensive treeless plains, consisting of black earth and covered solely with herbaceous vegetation. The Don and Volga steppes, familiar to me since my childhood, were of this type. No hill-type elevations are observable on their level horizon. Although I covered hundreds and even thousands of *versts* in black-earth Russia in my childhood and youth, in no way could I imagine what a mountain looked like, as I had seen mountains only in pictures and was prepared to regard them as artistic flights of imagination and not as reality. That which our Great Russian people understood by the name of mountains were, on the one hand, slopes into hollows or gullies, washed through by prehistoric diluvial streams or present-day spring floods in our boundless Sarmatian plain, and, on the other hand, those climbing up the other side of these hollows and gullies. Thus, intersecting our Great Russian steppes, so-called mountains have a negative relief, that is, they do not consist of eminences above the steppe level, but, on the contrary, of hollows, in which forest vegetation huddles, whereas the level surface of the steppe itself was covered solely with herbaceous vegetation, luxuriant in the spring and at the beginning of summer, and burnt up by the scorching rays of the sun by the autumn. However, during the five winter months this whole surface is covered with a deep layer of snow, which gives new life to our steppes when it melts.

I encountered an entirely different type of steppe in Asiatic Russia across the immense space between the Urals and the Altai, which constitutes the southern part of the West-Siberian lowlands. What the Siberian steppes have in common with the south-Russian black-earth steppes is that there is no high ground of any kind across their entire expanse, that they are also very rich in herbaceous vegetation and that their flora have a great similarity to the flora of our steppes. But an important difference between them lies in the fact that although Siberian steppes are rich in magnificent meadow lands, these areas frequently alternate with more or less vast copses (*kolki*), consisting of deciduous trees (birch, aspen, poplar, and so on) and that these *kolki* are not hidden in hollows but grow on the very surface of the steppe. There is a considerable difference in the soil itself of the two steppes in that, although the soil of Siberian steppes is fertile, it cannot be regarded as typical black-earth soil.

Siberian steppes also have their peculiarities with regard to their irrigation.

The majestic rivers which water the West-Siberian lowland flow from afar, as they originate mainly in the Urals and the Altai, and when they come out to the lowland, not encountering those hollows which are flushed through by diluvial waters in which the Sarmatian plain of European Russia abounds, they flow along the very surface of the lowland, excavating shallow channels for themselves in the soft and friable soil. In so doing, they constantly squeeze against their right-hand bank (according to Baer's law),<sup>1</sup> and, undercutting it, they make it steep and hilly, so that from afar it looks like an eminence, limited, however, by a straight line on the horizon.

After Omsk, in the so-called Baraba, I came across another, third type of steppe, new to me. Despite the same flat character and the alternation of meadow lands with deciduous copses, the Barabinsk steppe<sup>2</sup> is characterized by an absence of running water and by the predominance of more or less large freshwater lakes.

Finally, I came across the fourth, and for me totally unexpected, type of the steppe beyond the Irtysk while I was travelling between Semipalatinsk and Aiaguz. With the steppes of our Sarmatian black-earth plain, the Kirgiz steppe, which I crossed here, had only one thing in common, namely a total absence of forest and an abundance of herbaceous vegetation, unusually luxuriant in spring and at the beginning of summer, completely scorched in the autumn, and in winter months covered by a snow-sheet so light that livestock, digging up the snow with their hooves, found grass for themselves even during these winter months. But the most striking difference between the Kirgiz steppe and our south-Russian steppe is that on its horizon there often rise rocky elevations, which consist either of rounded dome-like porphyry hills or of sharply outlined granite ridges. In running water the Kirgiz steppe is extremely poor, but in its rocky heights there are springs and sources, and on the surface of the steppe itself are to be found lakes, but almost always with brackish water. The very character

<sup>1</sup> This law, proposed by K. M. Baer in 1857, stated that the courses of major rivers swung to the right in the northern hemisphere and to the left in the southern hemisphere under the influence of the Earth's rotation on its axis. Consequently, they tended to undercut those respective banks, making them generally higher than the opposite ones. Kalesnik, *Entsiklopedicheski slovar'*, pp. 45-6.

<sup>2</sup> Barabinsk steppe strictly refers to that part of the West-Siberian Lowland between 53° and 56°N, north of the Kulunda steppe, although the name was sometimes incorrectly applied to the marshy forest plains of Vasiugan in the Narim and Surgut districts of Tomsk and Tobol'sk provinces, respectively. In the Baraba and Berezovaia steppes, marshes and lakes were interspersed with birch copses, but, by comparing maps of the eighteenth and nineteenth centuries, Iadrintsev demonstrated that lakes had dried up or become saline. From 1744 some 20 post-stations were established between Tara and Tomsk, and two or three decades later exiled landowners, peasants and fugitive soldiers were brought in as settlers by Governor Chicherin, a process continued by Slotsov and Gel'mersen in the 1820s and 1830s as roads were improved.

Numerous archaeological relics of twelfth- to seventeenth-century settlement in the Barabinsk steppe have been uncovered since the 1920s and a systematic survey has been conducted by the Siberian branch of the Academy of Sciences since the middle 1970s. Molodin *et al.*, *Baraba*.



of the vegetation, which consists often of luxuriant types of grass and bushes, is totally different from that of our steppes, for in the flora of the Kirgiz steppes there predominate not the European forms, as in our Siberian steppes, but purely Asiatic ones. Thus, this fourth type of steppe differs even more from our central and south-Russian, than both Siberian types.

What, ultimately, do the Russian people mean by the term 'steppe'? Apparently, it is the vast plains, rich in herbaceous vegetation, still untouched by agriculture. Moreover, the concept of the steppe is not contradicted either by the presence in it of solid rock groups and ridges (as noted in the Kirgiz steppe) or by the growth of copses, consisting of deciduous forest types, as in the Ishim and Barabinsk steppes. Irrigation is the necessary condition for the existence of the steppe: waterless steppe ceases to be steppe and becomes desert. But the nature of the irrigation of the steppe can be very varied. The steppe may be watered by rivers, flowing either across its totally level surface, or in more or less deep hollows. Finally, the steppe may have no running water at all, but be covered with freshwater or saltwater lakes. But it is even more necessary that in winter the steppe should be covered with an unbroken layer of snow, which is an indispensable attribute of the steppe, since the melting of this layer restores that mantle of vegetation which is the main characteristic of the steppe.

The town of Aiaguz<sup>1</sup> was situated on the right bank of the river of the same name, which was only ten metres wide here, but I rejoiced at this insignificant small river, as it was the first running water I had encountered along 270 *versts* from the Irtysh, and besides it already belonged to the basin of Lake Balkhash.

This town was originally built about thirty *versts* higher up the river Aiaguz where it was crossed by a caravan road, but soon after the town's foundation there the caravan road deviated from it and began to cross the river thirty *versts* lower. Then the town was transferred to this, its present, site, but the caravan road reverted to its old place. However, the town no longer wanted to swing, like a pendulum, from one side to another, and remained on its second site. At the time of my visit it was in such a pitiful and paltry state as I had never had occasion to see a single Russian town. It was built on one, the lower, bank of the insignificant little river, which could be forded anywhere, and consisted of a clay fortification<sup>2</sup> with bastions and curtain walls, which were already disintegrating and inside which there were some government buildings (a barracks, a hospital and an unfinished brick church). Strictly speaking, the town consisted of one wide street with such low, adobe houses that one had to stoop in order to speak with the inhabitants of these little houses when they stood at their windows. There were no shops at all in the town: the only one, which had lasted for a short

<sup>1</sup> Aiaguz (re-named Sergiopol' after 1860) lies 288 km from Semiplatinsk. It was an *uezd* town in the original Semirechensk *oblast'*, its Tatar and *cholokazak* Russian population, still only about 800 strong towards the end of the century, trading with the Kazakhs.

<sup>2</sup> Kosharov no. 61.

time, had closed down because, so the shopkeeper who had gone bankrupt assured me, no one wanted to pay money for the goods, and everybody demanded they be given them gratis! On the other side of the river there arose rocky hills, on which in the evenings wolves howled and their eyes could be seen flashing in the darkness. In the town I put up at a small, but clean and well whitened house of a well-to-do Cossack and stayed all of the next day, spending two nights here. Such a day's rest proved to be necessary, principally for sorting out and packing my rich geological and botanical collections. The day was hot: at seven o'clock in the morning it was  $15^{\circ}$  in the shade, at two o'clock in the afternoon it was  $21.5^{\circ}$ , and at nine o'clock in the evening it was still  $19^{\circ}$ .

My main excursion on 8 August was directed upstream along one of the constituent branches of the river Aiaguz, where six *versts* away from the town there were limestone quarries, and three *versts* away there was a brick-yard, where bricks were made for building the church and the house of the town's commandant (this commandant was a Cossack captain, or *esaul*). The vegetation of the hills I visited was very poor. Apparently, however, there was no shortage of mineral resources in the environs of Aiaguz: I was brought samples of excellent graphite, found about forty *versts* away from the town on the upper reaches of a river which discharged into the Aiaguz, and samples of coal, from a deposit which lay seventy *versts* away from it in the same direction.

On 9 August, early in the morning, after my second night in Aiaguz, I set out for the town of Kopal. The first four stages (over 100 *versts*) went along the course of the river Aiaguz,<sup>1</sup> which we forded on more than one occasion. This stream was accompanied by fairly level steppe; there were no mountains to be seen. Along the river there grew trees, mainly poplars, silver and heterophyllous (*Populus alba* and *P. euphratica*). At the fourth relay station from Aiaguz, Malo-Aiaguz, we parted with the river Aiaguz and after two stages (about sixty *versts*), covered at night, at dawn on 10 August we reached the station of Arganat picket, which interested me.

This picket was situated in a gorge in a small mountain group, which consisted of rocks of black siliceous schist, steeply uplifted by porphyry. A spring of pure water was flowing along the ravine past the picket. The road went up along this ravine. I stopped at the picket in order to change to a riding horse and, accompanied by two Cossacks, to undertake an excursion to the reeds bordering Lake Balkhash, which could be seen from the picket in good weather. Unfortunately, when we had left the picket and made a few *versts* towards Balkhash, the clouds gathered on all sides and it started raining heavily and we got soaked, as they say, to the skin. The excursion was a failure; we had to return to the picket. Transferring to my *tarantas*, I decided to continue my journey to Kopal. After two

<sup>1</sup> Kosharov no. 129 (3).



PLATE IV. Fort at Aiaguz (no. 61)



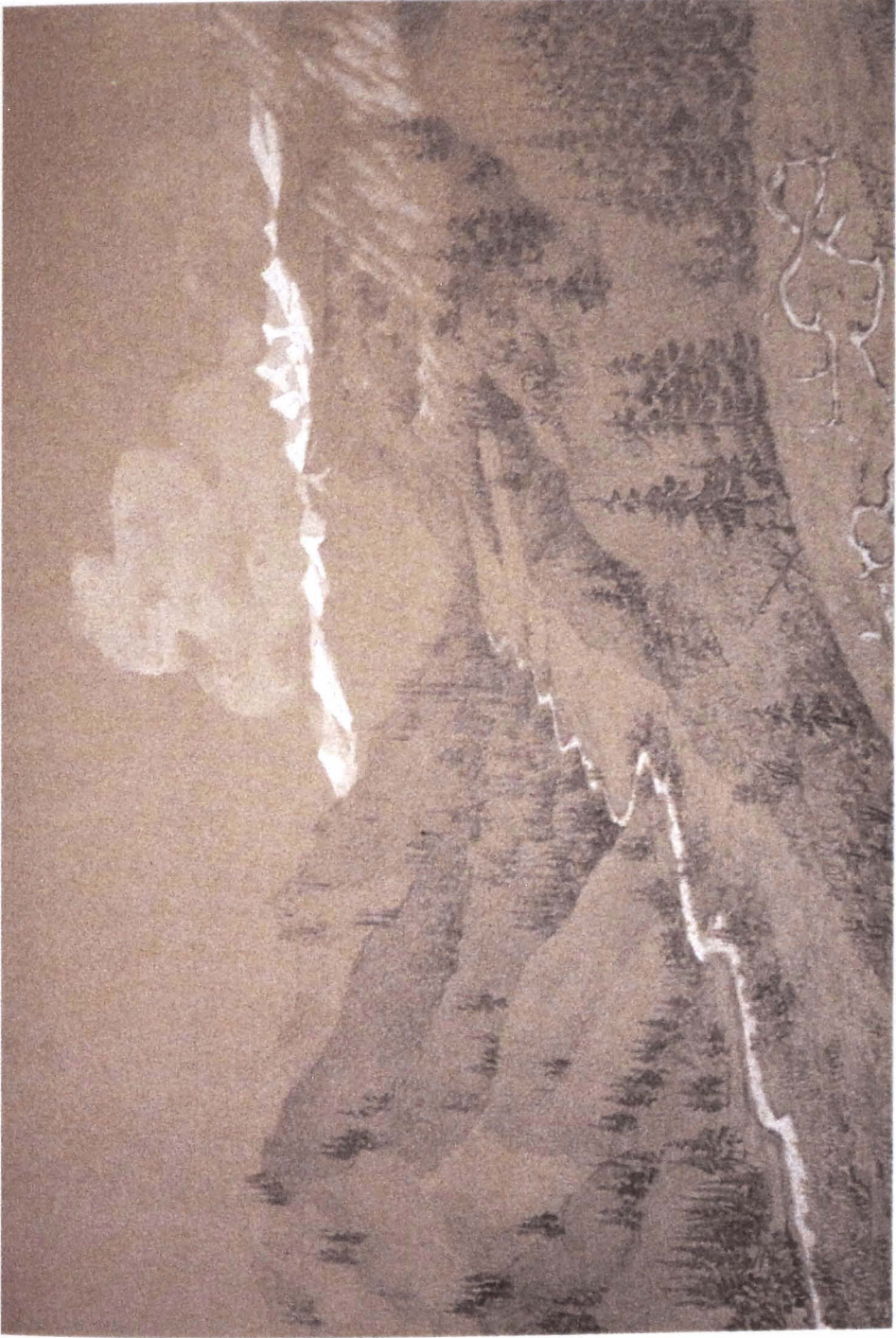


PLATE V. Valley of the Chirik-su (no. 139)

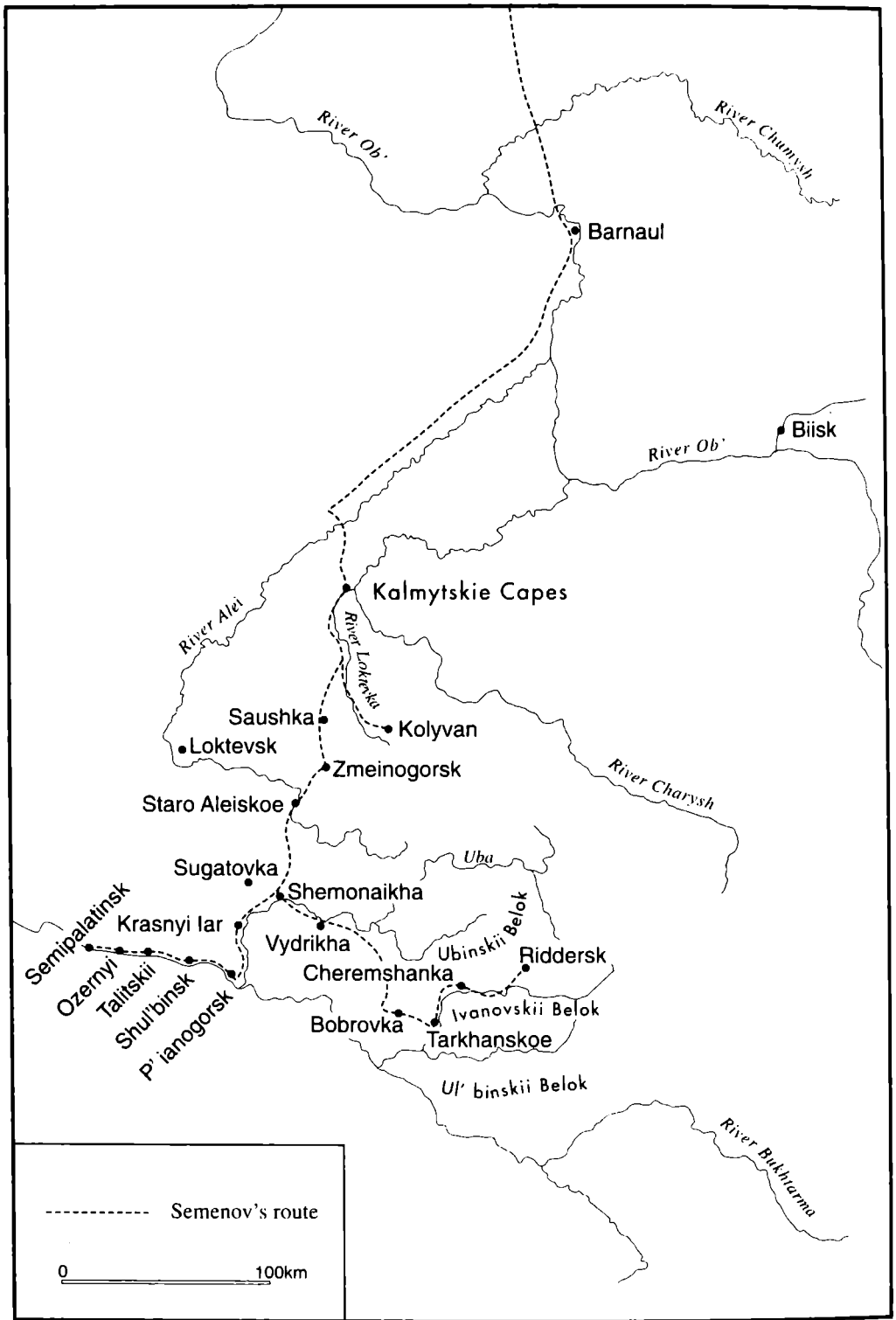


FIG. 2. The Altai mining district

stages (sixty-five *versts*) I reached Lepsinsk picket<sup>1</sup> and came out onto the river Lepsa. It was the first significant river of Semirech'e. By the time we arrived at the Lepsa the rain had already stopped and I was able to make a good collection of interesting plants of Semirech'e flora. The river was forty metres wide and fast flowing; we ferried it. Beyond the Lepsa stretched a vast sandy steppe, and along its banks there grew trees: willow (*Salix viminalis*) and poplar (*Populus laurifolia*).

The locality was enlivened by rich ornithological fauna. Here for the first time we saw steppe hens: that was what the Cossacks called the most typical Central Asian birds, peculiar, incidentally, to the wild life of Semirech'e; in taxonomy it is called *Syrnhaptcs paradoxus*, while we call it *sadzha* or *kopytka*. Moreover, we saw many bustards, and shot partridges (*Perdix dauricae*) and steppe sandgrouse (*Pterocles arenarius*) with success too.

That day (10 August) I crossed the Baskan, the second significant river of Semirech'e, at Baskan picket, and reached the third river, the Aksu, at Aksu picket, after two stages from the Lepsa (sixty-five *versts*), where I spent the night. What gave an incredible fascination to that part of Semirech'e which we traversed that day was that, on the side of the sources of the river Lepsa, in the south-east, before us there extended in all its grandeur the gigantic snowy ridge of the Semirechensk Alatau (now called Dzhungarian Alatau) which rises from the low-lying Pri-Balkhash steppe to far beyond the snow-line even more strikingly than the Alps from the Lombardy plain.

On 11 August, having spent the night at Aksu picket and having traversed one more stage (twenty-three *versts*) up to Karasu picket, I began to go up into the mountains on a high spur of the Semirechensk Alatau. This entire pass, at that time known by the name of Gasfortov (as it had been established by the Governor-general himself) was situated between Karasu and Arasan stations, which were twenty-seven *versts* apart. For about five *versts* the road climbed the mountain through a narrow gorge, which consisted of wild precipices of argillaceous schist, rising very steeply. In about two hours of steep climbing we reached the top of the ridge, which, however, hardly exceeded 1,300 metres of absolute height, and in any case it did not yet have alpine vegetation.

After a few *versts* of travelling across the plateau and seven *versts* of a gently sloping descent, I saw before me, at last, the winding ribbon of the river Biën<sup>2</sup>

<sup>1</sup> Lepsinsk, founded in 1855 as Verkh-Lepsinskaia, received its later name in 1883 when it was re-designated as a town. It is located at 800 metres above sea level and 702 km south-east of Semipalatinsk. Muslims made up 38% of its population of 3,488 in the late nineteenth century, but in the surrounding *uezd* nomadic Kazakhs, migrating between the steppe in winter and the Dzhungarian Alatau and Tarbagatai mountains in summer, constituted 84% of the total. Both the Cossack settlers in neighbouring *stanitsy* and the Kazakhs engaged in cultivation of spring wheat and oats, while the Russian town-folk also practised market-gardening. Livestock breeding was mainly a Kazakh occupation, and fur and skins resulting from hunting provided a significant supplementary income. The flora of the upland meadows mentioned by Semenov gave rise to bee-keeping, with honey being traded at the Irbit fair.

<sup>2</sup> Kosharov no. 57.

and beyond it the interesting Arasan settlement.<sup>1</sup> The Biën is a fast and foamy mountain river, rushing over stones and rocks.<sup>2</sup> Washed by it and sticking out from it, they consist of granite. Many of these rocks were piled up beyond the river too, and apparently had been carried there by it, but in any case not from a distance, as these same granites appeared at the surface half a *versta* from the settlement. The settlement consisted of twenty houses, one of which, built right above a spring, was very neat and even handsome. The Arasan basin was divided into four pools, each about six metres long and four metres wide. Water in them came out from a clean bottom from under cleared stones. In it bubbles of gas escaped with force in three places. I found the temperature of Arasan to be 26.5°C. A smell of hydrogen sulphide could be very faintly sensed. There is no doubt that, after dispersing, the temperature of the source decreased somewhat, and the gases which escaped from its base began to linger less. In front of the house was laid out a garden in which, however, the trees had not yet had time to grow up. But what already lent charm to the whole area were the arable lands of the Kopal inhabitants, which were unusually rich in their crops of wheat and oats and in their soil fertility. These lands stretched from the town of Kopal itself across the entire Dzhunke plateau<sup>3</sup> up to the river Biën, which supplied irrigation to them. If one takes into consideration the fact that at that time many of Kopal's inhabitants cultivated up to twenty *desiatiny* per taxed household, it is possible to imagine what a flourishing Russian colony Kopal already was in Semirech'e. It had been founded fifteen years earlier in a locality, whose fertility and convenience for the foundation of a settled Russian agricultural colony were appreciated for the first time by G. S. Karelin,<sup>4</sup> the famous Russian traveller, who in 1840 became the first to penetrate the northern part of Semirech'e.

<sup>1</sup> The sulphurous springs at Arasan began to be exploited as a spa in the 1860s and developed into the modern Arasan-Kopal resort in Taldy-Kurgan *oblast'*. The weakly mineralized waters at temperatures of 22.9° and 38.2° are now recommended for treatment of circulatory, digestive and gynaecological ailments.

<sup>2</sup> Kosharov no. 91.

<sup>3</sup> The Dzhunke 'plateau' is in fact a high valley separating the main mass of the Dzhungarian Alatau from the Arasan Ridge. Extending over 1,500 square km, its mean altitude is about 1,300 metres above sea level, but in the nineteenth century the greater part, especially along the rivers Kyzyl-agach, Biën and Kopal, was used for tillage by the Cossacks and inhabitants of Kopal.

<sup>4</sup> Grigorii Silich Karelin (1801–72) completed a course at the First Cadet Corps in Petersburg in 1817 and entered service as an artillery ensign, but in 1822 was exiled to Orenburg for writing epigrams about the royal favourite Arakcheev. From extensive travels through the western parts of the Kazakh steppe he collected geographical, ethnographic and environmental data and in 1834 and 1836 led two naval expeditions to investigate the eastern shores of the Caspian Sea, establishing the basis for Fort Aleksandrovsk. During the latter journey Karelin also mapped part of the shore of Kara-Bogaz-Gol and explored the ancient Uzboi channel of the river Amu-dar'ia. In the early 1840s, as a leading member of the Moscow Naturalists' Society, he travelled with the botanist I. P. Kirilov as far as the Altai, Semirech'e and the Tarbagatai range, making an enormous collection of flora and fauna, a considerable number of which were new to science, for museums at home and abroad.



I did not stay to spend the night in Arasan and on 11 August by evening I had already reached Kopal across the beautiful and fertile Dzhanke plateau, which was no less than thirty *versts* wide here. At that time Kopal was already a decent little town, consisting of 700 houses, with a wooden church in the square, and several pretty wooden houses belonging to the most prosperous Cossacks. In one such house, which served as an inn, I found shelter for myself, as there were no hotels in Kopal.<sup>1</sup>

Next morning I went to see Colonel Abakumov, commander of Kopal district, who received me extremely affably and cordially. He was an outstanding person, who had done great services to science too. While still a young Cossack officer, Abakumov had accompanied Karelin, the very talented naturalist and traveller, when in 1840 he made his first excursions to the northern parts of Semirech'e, into the mountains of the Semirechensk Alatau, and under his guidance became a fanatical hunter and naturalist. However, when Karelin settled down in Semipalatinsk and ceased going anywhere whatsoever from there, Abakumov, his former assistant during his travels, settled in newly founded Kopal and started going out from there both to the gorges and summits of the Semirechensk Alatau and to the Pri-Balkhash steppes, collecting in this still unexplored country ornithological, entomological and botanical material in the country, at first for Karelin, but after his departure on his recommendation entering into dealings with foreign naturalists, to whom he began to supply his collections. Many plants and animals were newly discovered by Abakumov, and some of them were given his name, as, for instance, one of the spring capricorn beetles or wood-cutters (*Dorcadion abakumovi*). However, during the last decade, following on promotion and confirmation of his role as the principal figure in the already flourishing town, the ageing Abakumov, too, had put on weight and stopped going out to hunt or on excursions, and limited himself to sending sent out the most capable of his former Cossack fellow-travellers to get natural history spoils.

It is understandable how my arrival inspired and enlivened this local veteran of detailed natural history investigations and discoveries; it is also understandable with what pleasure he placed his whole team at my disposal.

He spent the day of 12 August with me on excursions in the vicinity of Kopal, and the next day arranged for me to ascend the Semirechensk Alatau, to the perpetual snows of this ridge, but he decided not to accompany me himself, afraid of

<sup>1</sup> Kopal'skaia *stanitsa* was founded in 1841, 680 km south of Semipalatinsk on newly occupied Russian lands, and received town status in 1854. At the end of the century it consisted of an urban settlement and a nearby Cossack *stanitsa*, with 2,847 and 2,112 inhabitants (348 and 323 houses), respectively. Most of the town's population were Kazakhs and were engaged in agriculture, although there existed numerous small industrial enterprises such as smithies, tanneries and flourmills, and merchants conducted trade with Kul'dzha. Of the *uezd*'s 147,000 inhabitants, some 108,000 were nomadic Kazakhs of the Middle Horde who migrated with their livestock between the southern shores of Lake Balkhash in winter and the valleys of the Dzhungarian Alatau in summer.

revealing before me his only weakness, without which he would have been an ideal master of such an interesting territory as was Kopal *okrug*: this weakness was that very one from which a great many of the most talented public figures of our remote outlying districts suffered, alcoholism, owing to which Abakumov was invariably in a state of total irresponsibility after dinner.

On 13 August, at dawn, accompanied by six select Cossacks, I was already on my way to the mountains. Having forded the river Kopal, we started climbing in a south-westerly direction, where the ascent was gentlest. I took samples of rocks all along my journey. Right at the beginning of the climb I came across a vein of whetstone, which had been discovered here by Abakumov and had already been used by Kopal's inhabitants instead of being ordered at a high price from European Russia. This whetstone turned out to be a rather soft diabase with crystals of pyrites. Further along the route we traversed strata of metamorphic schist, steeply inclined at an angle of 70°. After an almost four-hour climb on strong and healthy horses we reached the crest of the ridge and turned along it towards the east. It transpired that the high ridge, along which we were going, separated the wide Kopal plateau from the deep valley of the mountain river Kora, one of the constituent branches of the Karatal, an important river of Semirech'e. This whole ridge extended from west to east and carried not only belts but also exposed areas of snow which never melted, i.e. perpetual snow. But beyond the deep valley of the river Kora there extended another crest, parallel to the Kopal one, and this crest surpassed the limits of perpetual snow on some of its peaks. In particular, two of its summits were totally whitened with perpetual snow, which descended from one of them quite low onto its northern side to the head of a transverse valley, where the left tributary of the Kora was flowing noisily. The hollow in which this tributary originated was enveloped by steep snow slopes and looked like a glacier, but unfortunately I could not explore it because the distance to it was too great, and I would have had to devote several days to this exploration. The view over the valley of the river Kora was delightful. It reminded me of the beautiful valleys of Grindelwald and Lauterbrunnen.<sup>1</sup> The height of the crest along which I was travelling seemed to me to be at least 1,500 metres higher than the Kopal plateau, but it stood even higher above the deep valley of the Kora. This wide and full river, to ford which, I was told, was very difficult and sometimes quite impossible, from above seemed like a narrow silvery thread; however, in spite of its distance, it filled the air with the savage roar of its foamy waves, as they leaped swiftly over the rocks. The foam and spray of this river had that special milky colour which is peculiar to rivers begotten by glaciers. Here and there along the river were visible dark green strips of forested islands, the scale of the size of which could be established by the dark and well-proportioned ancient Tian'-Shan' spruces (*Picea schrenkiana*) growing on them,

<sup>1</sup> Grindelwald and Lauterbrunnen had been visited by Semenov in 1853-4.

which had obtained their scientific name in honour of Alexander Schrenk,<sup>1</sup> a traveller contemporary with Karelin, who also reached the Semirechensk Alatau and Lake Balkhash in 1840. Similar spruces protrude from the cliffs and slopes of the majestic Kora valley. Beyond the river, mountains rose abruptly, at first covered with Siberian silver firs (*Abies sibirica*), further along with bushes, then bare and overgrown with alpine grasses, finally disappearing under the snow mantle. Here and there on the snow there were visible what seemed to be horizontal and vertical paths. On examination through a telescope the horizontal paths turned out to be deep clefts, and the vertical ones tracks of fallen avalanches.

No matter how much I was attracted by this fascinating valley, it was out of the question even to think of going down, and I decided to follow the crest, getting across from one elevation to another and trying to reach the boundary of the perpetual snow. We travelled on horseback until the granite rocks, piled wildly on top of each other, blocked our way. Here we had to leave our horses, and I set out now on foot with three Cossacks on a track, along which a herd of wild goats (*Capra sibirica*) scudded with fright before us; with extraordinary lightness they jumped from one rock to another. We also had to jump across the deep transverse clefts or go around them, going down slightly to the Kora valley, where the boulders were not so huge and the fissures were easier for crossing, which was facilitated by the sturdy trunks and branches of Cossack juniper (*Juniperus sabina*) growing in them. Thus I reached the ultimate point of my ascent: one of the peaks of the crest, in a hollow on which there was an exposed area of perpetual snow. Here I decided to halt in order to measure the height at which we were, and which could hardly be less than 3,000 metres. I carried out my measurements by means of an apparatus for boiling water, since my barometer had not stood up to the travelling and had broken while still in Siberia. I set to work on my apparatus, but however hard I tried to light the spirit, poured from a bottle which the Cossacks had in their hands, it would not burn, because, as it turned out, half of it had been drunk by one of the Cossacks accompanying me, and had been diluted with water. Afterwards I learnt from Abakumov that in the Cossacks' presence Karelin used to poison all his supply of spirits necessary for scientific purposes, with the strongest poison, and in the Cossacks' presence would offer this spirit to a dog, which died immediately, and that only in this way was he able to break the Cossacks of their plundering of spirits. But the matter was

<sup>1</sup> Aleksander Ivanovich von Schrenk (1816–76), of Lithuanian ancestry, studied mineralogy at Dorpat University and in 1837–44 worked at the St Petersburg Botanical Gardens. He travelled widely in Lapland, the Urals, the Siberian tundra and the Kazakh steppe, publishing *Reise nach dem Nordosten des europäischen Russlands, durch die Tundra der Samojeden, zum arktischen Uralgebirge* (2 vols, 1848). He should not be confused with Leopold Ivanovich Schrenk (1826–94), ethnographer and naturalist, who also attended Dorpat University and explored the Amur and Sakhalin in 1854–6, later becoming Director of the Museum of Anthropology and Ethnography in Petersburg (1879–94).

irretrievable for me that day, and I suffered an annoying setback. I had to be satisfied with a full collection of rocks on my route, a rich collection of alpine plants<sup>1</sup> and a small number of coleopterous insects.

The alpine flora luxuriantly covered the rocks of the peaks of Kopal ridge with its marvellous flowers. The flora of the whole Kopal crest had an entirely alpine character, but among the plants which constituted it there were also European (both alpine and northern), Altai ones to an even greater degree, and partly also local Alatau plants, a considerable part of which I later found on the Tian'-Shan'.<sup>2</sup>

A spring which came from under the ground near our stopping-place, about sixty metres below the snow clearing, had a temperature of 1.5°, and the air temperature in the shade was 9°, but the heat from the sun was very strong, and, of course, the snow, which had not melted at this time of the year, had to be accepted as permanent, of which it was easy to be convinced from its composition.

However, when we made a move from our stopping-place after collecting alpine plants, the day was declining, and it was already six o'clock in the evening. Dusk overtook us half-way on our descent, which was very steep, because we were going straight in the direction of Kopal. When we came into the zone of coniferous woods, it had got completely dark, and, stumbling and falling down, we had to lead the horses by the rein, forcing our way between the rocks and

<sup>1</sup> [Semenov:] Here is a list of the plants collected by me in the alpine zone of the Kopal chain: fam. Ranunculaceae: *Anemone narcissiflora*, *Ranunculus hyperboreus*, *R. altaicus*, *Trollius asiaticus*, *Isopyrum grandiflorum*, *Aconitum rotundifolium*; fam. Papaveraceae: *Papaver alpinum*; fam. Cruciferae: *Draba stellata*, *Erysimum cheiranthoides*; fam. Droseraceae: *Parnassia laxmanni*; fam. Sileeneae: *Dianthus alpinus*, *Alsine verna*; fam. Geraniaceae: *Geranium albiflorum*; fam. Leguminosae: *Oxytropis amoena*, *Ox. fruticulosa n. sp.*, *Ox. algida n. sp.*, *Ox. platysema*, *Ox. oligantha n. sp.*, *Hedysarum obscurum*; fam. Rosaceae: *Potentilla opaca*, *Pot. nivea*; fam. Crassulaceae: *Umbilicus alpestris*, *Sedum ewersii*; fam. Saxifragaceae: *Saxifraga sibirica*; fam. Compositae: *Rhinactina limoniifolia*, *Erigeron uniflorus*, *Richteria pyrethroides*, *Leontopodium alpinum*, *Doronicum altaicum*, *D. oblongifolium*, *Saussurea pygmaea*; fam. Pyrolaceae: *Pyrola rotundifolia*; fam. Primulaceae: *Primula cortusoides*, *Pr. algida*, *Androsace septentrionalis*, *Cortusa matthioli*; fam. Gentianeae: *Gentiana aurea*, *G. barbata*, *G. frigida*; fam. Boraginaceae: *Myostis silvatica*, *Eritrichium villosum*; fam. Scrophulariaceae: *Gymnandra borealis*; fam. Labiatae: *Dracocephalum altaicense*, *Dr. peregrinum*; fam. Liliaceae: *Allium platyspathum*.

<sup>2</sup> [Semenov:] Among the plants collected by me on the Kopal crest on 13 August, the following plants were already known from the alpine flora of Switzerland, Sweden and other European countries: *Anemone narcissiflora*, *Ranunculus hyperboreus*, *Papaver alpinum*, *Draba stellata*, *Dianthus alpinus* (in a different variant), *Alsine verna*, *Hedysarum obscurum*, *Potentilla opaca*, *P. nivea*, *Erigeron uniflorus*, the widespread Alpine Edelweiss (*Leontopodium alpinum*), *Primula cortusoides*, *Cortusa matthioli*, *Gentiana aurea*, *Dracocephalum peregrinum*. But in this flora I also came across some plants, widespread in our northern Russian (Sarmatian) plain: *Pyrola rotundifolia*, *Androsace septentrionalis* and our ordinary forget-me-not (*Myosotis silvatica*), and from the plants of the Siberian plain: *Trollius asiaticus* and the Polar *Gymnandra borealis*. In this zone there were more Altai plants, namely: *Isopyrum grandiflorum*, *Sedum ewersii*, *Saxifraga sibirica*, *Doronicum altaicum*, *Primula algida*, *Eritrichium villosum*, *Dracocephalum altaicense*. All the remaining types of plants belonged to Central Asian flora of the local alpine zone and turned out to be partly spread in Tian'-Shan' too. Of these plants of local Alatau flora, found by me that day for the first time, there were later given the following names: *Oxytropis fruticulosa n. sp. p.*, *Ox. oligantha n. sp.*

felled trees. At last we came out to a wood-cutters' path, which passed through the gorge in which the first Russian team which came here had wintered in 1841, during the occupation of the Kopal area for the first Russian settlement in Semirech'e district. It was very late in the evening when the lights and the barking of dogs heralded our safe return to Kopal.

The fact that I had got out of the habit of riding and excessive fatigue from too difficult an ascent took their toll of me. I somehow managed to get through 14 August putting in order my rich collections from the previous day, but the next day I took to my bed. The following three days I could not move and only on the morning of the 18th I got into my *tarantas* with difficulty in order to travel at walking pace to Arasan. Warm baths had the most beneficial effect upon me: the unbearable pains ceased, and on 19 August I was delighted to be able to make my first excursion five *verst*s away from Arasan. During 20–23 August, I made excursions daily from fifteen to twenty *verst*s in all directions from Arasan, downstream along the river Biën and up the mountains, to the Keisykauz gorge, to the Kopal arable lands, and so on.

During these excursions I familiarized myself with a fantastic-looking conglomeration of rocks along the river Biën, as it were heaped up one upon another so that they could afford refuge to many people in the spaces between them; with the river, so abundant in water that it was easy to disperse into *aryki* (irrigation ditches) for watering the extensive arable lands; and also with the interesting fauna of the stony banks of the Biën, which included by a great many tortoises (*Testudo horsfieldi*) and birds, especially rock partridges (*Caccabis chukar*) and steppe grouse (*Pterocles*).

Observation of cereal crops here convinced me that this remarkably fertile locality, if it made room for a fairly strong Russian colonization, would immediately become one of the stable strong points of our dominion in Middle Asia. Cereal crops here consisted of wheat, oats, rye, *iaritsa*, and some maize and sorghum, but millet did not thrive satisfactorily. Sowing took place around 20 May, the first watering of the fields was at the beginning of June, and the second around 20 June, and harvest began at the beginning of August and was finished during my stay in Arasan. This year yielded on average twelve *chetverti* of wheat from each *desiatina*, and twenty *chetverti* of oats. Horticulture was also developing successfully here. Peach-trees and vines planted in orchards were growing very quickly, not to mention apple-trees, which had already borne fruit.

On 24 August I felt well enough to make up my mind to continue my journey in the direction of Fort Vernoe. Leaving Arasan early in the morning, I accomplished my trip to Kopal without tiredness at about three o'clock, and just before reaching Kopal I saw a sand-storm. In Kopal I had nothing else to do but to say goodbye to Colonel Abakumov, who had been so attentive and courteous towards me. I left Kopal at four o'clock in the afternoon for my further, and to

me highly interesting, journey, preceded by Abakumov's most favourable dispositions for my entire subsequent journey through Kopal district.

The road went straight westwards, along the northern foot of Karatau or Kopal ridge, which separates the fertile Dzhunke plateau from the deep valleys of the rivers Kora and Karatal, and after the first stage up to Ak-Ichke picket (twenty-five *versts*) I began to go uphill and across the lower extension of the Karatau. The sun had already set, the distant snowy tops of the Semirechensk Alatau in the east were lit up with a pink colour (*Alpenglühén*), while in the west the evening glow had disappeared behind the low patterned crest, and at last there remained in the sky only the two-horned moon, which lit with its pale light the high mountain precipices by which our road passed. It was in this somewhat fantastic light that I was struck by an unexpected phenomenon, which I experienced for the first time in my life: the rocks started to sway, and land-slips were falling down incessantly with a crash from the mountain tops; this was a quite strong earthquake. Fortunately, everything turned out alright for us and, unharmed, at half past nine in the evening we reached Sarybulak picket, which was fifty *versts* and a bit away from Kopal, and I spent the night in a clean spacious room at this picket.

Leaving Sarybulak the next day (25 August) early in the morning, after about five *versts* I reached the river Karatal,<sup>1</sup> one of the most important rivers of Semirech'e, which having only just broken away here from the mountain valley which constrained it, rushed over the rocks and stones, breaking into a multitude of branches and forming numerous rapids. Fords across the river were difficult here, because of the unusual rapidity of the two main branches of the Karatal. To facilitate crossing, the road went upstream on the Karatal about twenty *versts* to the newly founded Karabulak picket, at that time not yet quite completed and consisting of a group of temporary *iurty*. What struck me at this picket was the fact that usually all the pickets which had existed for many years were located on a totally bare surface, and no trees were planted near them, but here I saw that around a still unfinished picket there was a whole little garden. But very soon I was to be disappointed: this garden consisted of quite large trees, which had been brought from the Karatal gorge and stuck in the soil to look like a garden only for the occasion of my arrival, which was explained by the fact that before my arrival in Kopal, a rumour had circulated that a government inspector was coming from Petersburg, and that he paid special attention to growing trees and plants everywhere, and that was why he was called a 'Minister of Botany'. This rumour was

<sup>1</sup> The river Karatal ('Black willow'), flowing 320 km in a north-westerly direction from three sources in the snows of the Semirechensk Alatau, has an average width of about 42 metres, particularly below Karabulak where it is joined by the Kok-su. Its clear but rocky waters are six or more metres deep in June and July but are fordable at many places later in the year. The upper courses of the tributaries are well wooded, but on entering the steppe the river's banks soon appear desert-like and agriculture is sustained by irrigation. Dessicated lake beds were exploited for salt, while the neighbouring Dzhair tribe of Kirgiz were predominantly nomadic pastoralists, moving from the parched lowlands to the mountains in summer.

based on the fact that I was named as a Master of Botany in the letter of commendation given to me by the Russian Geographical Society, and it was further strengthened by the fact that, after my first visit to Kopal, Abakumov gave an order, which was fully implemented subsequently, that the pickets were to be lined with trees.

The previous picket road from Kopal to Vernoe came out onto the Karatal at Karatal picket, which was eight *versts* away from the present Karabulak picket, further up the valley of the Karatal river itself. The picket had been transferred to Karabulak, while on its previous site, on the right bank of the Karatal, there remained a permanent Cossack settlement, a *khutor* in an area rich in hay-fields, which were lacking in Kopal. Not far from this *khutor*, permanent settlements of so-called *cholokazaki* had sprung up on both banks of the river. By the term *cholokazaki* they meant here emigrants from Tashkent who had founded permanent settlements in the steppe, having married Kirgiz women. At the end of the 'forties such *cholokazak* settlements began to spring up in Karatal too. These settlements consisted of thoroughly white-washed cottages with flat roofs, and stoves adapted for the winter residence of the *cholokazaki* who built them, and who provided themselves with Kirgiz wives in the same way as the Romans abducted Sabine women. Cossacks called these settlements '*kurgani*' and highly praised the skilfulness of their inhabitants, not only in field work, irrigation and cattle-rearing, but also in horticulture and building. At the head of one of these unauthorized settlements was an elderly patriarch, Chubar-mulla, who was pointed out to me as the only person who knew where interesting historical objects had been found in the Karatal valley. But I was no less interested in these objects, than in the Karatal *cholokazaki* themselves, as I had reason to believe that the majority of them were not Tashkent Uzbeks at all, but fugitive convict settlers from Siberia, who had lived for a long time in Tashkent, and who finally at the end of the 'forties and the beginning of the 'fifties formed an agricultural colony at the very edge of our Asian dominions at that time, on the river Karatal, under the protection of the foremost legal Russian agricultural colony, Kopal.

In order to find the ancient historical objects of the Buddhist cult,<sup>1</sup> about which I was told in Kopal, and at the same time to settle my doubts concerning Karatal *cholokazaki*, I decided to set off from Karabulak picket to the '*kurgan*' or settlement of Chubar-mulla, which was about eight *versts* away, up the Karatal valley on the left bank of the river, taking with me from the picket five workers armed with crowbars and an interpreter who was well acquainted with Chubar-mulla. Chubar-mulla's *khutor* presented a very pleasing sight in its outward appearance: it consisted of twenty well white-washed little houses with flat roofs, excellently made stoves and chimneys, and was camouflaged by the trees which

<sup>1</sup> Some of these Buddhist cult objects are still in the possession of the Semenov-Tian'-Shanskii family.

had been planted around them, and among which were forest trees peculiar to the Karatal valley, and still more fruit trees, apples and apricots, as well as vines. There were vegetables and maize in the kitchen-gardens. Already while approaching the *cholokazak* settlement I found the area of the autonomous Karatal colony very lively: continually I met Kirgiz people and *cholokazaki* on oxen and camels, and fine herds of cattle and typical Kirgiz sheep with their heavy fat tails, and herds of light horses. In order to reach Chubar-mulla's '*kurgan*', when we came level with it, we had to ford the river, as the *khutor* was on the other side of it. The ford across the Karatal was very difficult. The wild river divided here into several branches, and despite the dry season these branches, probably owing to the melting of the perpetual snows, were noisy and swirling torrents, full of whirlpools and rapids. Their islands were overgrown with shrub willow, bird-cherry trees, sea buckthorn, tall willows and poplars. We forded the river in zigzags, diagonally, across the crests of the rapids, past huge stumps, thrown around here on purpose so that the surges would not carry away the horses with the riders bringing them across. On the other side of the river we turned abruptly and soon found ourselves in front of the nearest dwellings of the settlement. The *cholokazaki* greeted us with perceptible distrust, and to the question where we could see Chubar-mulla, we received evasive answers. Then I sent my very shrewd interpreter to find him and to arrange a meeting with him for me. I instructed my interpreter to explain to the elderly *cholokazak* that I came from afar, from the capital, to see how people lived on the new Russian lands; that I rejoiced at the fact that people, in whom Russians had seen nothing but good during almost a decade, were settling on these lands; that they had established for themselves by their own efforts good permanent dwellings, warm in winter; and thanks to their expertise in horticulture they had laid out both small orchards and vegetable plots, sowed crops and kept good livestock, from which one might conclude that they had lived for a good number of years in 'Tashkenia', as they called it, where they had learnt a great number of beneficial things; that I knew very well when they had moved from Tashkent, but that I would not ask them where they came from and when they settled in Tashkent; that my visit to their '*kurgan*' could only be of benefit to them, as it would still further endorse their peaceful existence with their families in Russian lands, where the local authorities accepted them as residents, and where they had already lived for many years, doing no harm to anyone, but bringing no small benefit to Russian migration to the new lands.

After talking with the interpreter, Chubar-mulla came out to see me, and the reason why he had felt unable to show himself to me at once soon became clear. He was an old man, about eighty years of age, with obvious traces of brand-marks on his face. Our conversation took place without the interpreter, in Russian, which he spoke like a Russian but with a slight Tatar accent, easily explained either by the fact that he was by birth a Tatar from Kazan', or by the fact that,



having lived for a long time in Tashkent after his escape from penal servitude, he had got used to Tatar speech, although I did not ask any direct questions, especially concerning the time before his conviction. However, it turned out from our conversation that having settled in Tashkent as far back as in the 'thirties of the nineteenth century, he had earned his bread there by farming, gardening and doing general agricultural work. Tashkent's rich Uzbeks had quite a few such Russian workers, who had escaped from Siberia to Tashkent, and it was natural that all of them knew each other, and he was the oldest among them. In 1842 rumours reached these Russian people, who had already been living in Tashkent for a long time, that in Semirech'e a flourishing Russian agricultural settlement (Kopal) had sprung up, and Chubar-mulla, a courageous and enterprising man, who for many years had suffered from home-sickness in his exile in a foreign land, made up his mind to fulfil the irresistible desire, which had arisen within him, to see these new, rich outlying districts of Russian land, and if possible to settle there in order, at least, to die on native soil. He provided himself with three camels, loaded them with Tashkent goods (raisins, dried peaches and apricots, pistachios and Tashkent fabrics), reached Semirech'e without hindrance, sold his goods with profit, and provided himself in Kopal with Russian goods, with which he returned to Tashkent. On the way he enjoyed extremely cordial hospitality and secured temporary employment with Russian Cossacks in Karatal; and there, having picked out locations still completely unoccupied and convenient for irrigation and agriculture, he decided to settle together with his fellow-countrymen, likewise fugitives from Russia, under the name of *cholokazaki*, people of Tashkent origin. On his return to Tashkent he assembled a large caravan of a few dozen camels and of as many *cholokazaki* with a large quantity of Tashkent goods, of which raisins were the most popular, since the Kopal Cossacks distilled vodka from them, and importation of which from Russia was absolutely prohibited. Since then these Russian *cholokazaki* have made their homes once and for all in Karatal, and have started families, taking Kirgiz women as their wives, abducting some of them with their agreement, and paying bride-money for others.<sup>1</sup> The second generation of these *cholokazaki*, who were descended from these mixed marriages with Kirgiz women, was already from ten to seventeen years old, and their initially distrustful fathers ('immigrants from Tashkenia', as they called themselves) gradually ventured to speak to me in their native language, that is in Russian. One of them told me about an incident which happened to him when the Russian consulate in Kul'dzha was being built: on the recommendation of Kirgiz people related to him, he had been invited by Consul Zakharov<sup>2</sup> to build stoves. They talked with the consul for a

<sup>1</sup> For marriage customs among the Kirgiz and Kazakhs, see Krader, *Peoples*, pp. 141-4; idem, *Social Organization*, pp. 189-286.

<sup>2</sup> Ivan Il'ich Zakharov (1816-85) went to Peking on a mission in 1839-40 and was appointed first Russian consul in China at Kul'dzha in 1851. From 1869 he lectured on Manchurian language and

long time in Kirgiz and Uzbek languages, but still could not understand each other, and the stove-maker from the *cholokazaki*, unable to stand it any longer, asked the consul in Russian: 'But what kind of a stove does your Honour need: Russian or Dutch?' The Consul 'deigned to burst out laughing', but the *cholokazak* built him such a stove as the Chinese had never even seen in their born days, and for which he received both great gratitude and good pay. Naturally, Chubar-mulla had been familiar with field work since his childhood, but it was in Tashkent that he had learnt how to build irrigation ditches and to cultivate fruit-trees.

When my relations with Karatal's *cholokazaki* were fully established, and all their mistrust with regard to me had disappeared, with the pleasure and inquisitiveness typical of Russian people they took it upon themselves to show me the place in which a few years ago engineers, who were building a road here, accidentally came upon some interesting objects. According to the stories I had heard in Kopal, they were, among other things, some kind of round clay medallions, on each of which there was depicted a seated figure with legs crossed and a crown on its head, and then there were also some other objects, modelled in clay, of the shape and meaning of which I did not have the faintest idea.

Beyond Chubar-mulla's *aul* there were visible high burial mounds, such as occur frequently in Siberia, which contained so-called '*chudskii*' graves, but the *cholokazaki* led me not there but aside from the *aul* to a riverside mountain ridge, which rose about 100 metres above it and consisted of rocky cliffs of schists, tilted on edge, which extended from west to east and which had a natural dip at an angle of 80°. It was on these rocks and against these cliffs that man-made structures were leaning, formed of slabs of the same rock, but put horizontally and separated from each other by embankments of clay. Sometimes all this took the shape of small tumuli. With the help of my workers and *cholokazaki* I dug through one such tumulus across its entire height and breadth by means of a transverse ditch. The tumulus I dug across turned out not to be a grave. In it there were neither bones nor objects such as are found in graves, and I came to the conclusion that these man-made constructions were the dwellings and cells of Buddhist hermits or monks of the Dzhungarian empire<sup>1</sup> of the seventeenth

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having obtained his doctorate in Manchurian literature, and receiving the Konstantin medal of the Russian Geographical Society in 1878, became an ordinary professor at St Petersburg University in 1879.

<sup>1</sup> Dzhungaria was the name given by the Chinese to territories lying to the north of the Tian'-Shan' and comprising the former Dzhungarian empire. In the early eighteenth century its boundary led from Lake Balkhash along the river Irtysh to its source, then southwards to the eastern end of Tian'-Shan', following it to the Alai and Fergana ranges to the present site of Aul'e-ta (Dzhambul) and via the river Chu back to the southern shores of Balkhash. From 1758 it was occupied by armies of the Chinese empire but part of the area fell to Russia, during its penetration into middle Asia, as the Semirechensk and Semipalatinsk districts. Subsequently, the name referred to the Chinese portion, an area of nearly 8,400 square miles, well defined physically by the surrounding mountain chains. *B&E*, 76, pp. 805-9; Herrmann, *Historical Atlas*, pp. 48-9.

century. I failed to discover medallions with the image of Buddha on this occasion, because we came upon a tumulus, the rapacious excavation of which had been hastily carried out by the engineers, but we found hundreds of specimens of other articles, about which we had been told. Those were small objects, eight to ten centimetres tall, carefully modelled out of clay. In their appearance they bore a resemblance to the Monomakh cap,<sup>1</sup> with relief decorations on their upper conical part, and with Tibetan inscriptions all round. Obviously they were some kind of Buddhist cult objects, produced by handicraft methods by monks living in the cells at Karatal. Since the cells were built of heavy stone slabs, supported by wooden pillars of a very flimsy wood (poplar), this wood had rotted, and all the cells had collapsed, and at the time of my visit they had already become more or less like shapeless heaps of stones, amongst which it was possible now and then to make out something like corridors. By sunset I had to finish my work, having presented gifts to all my fellow-workers. I spent the night in a *cholokazak khutor*, enjoying the most cordial hospitality from the ex-convicts, who long since had changed into the most peaceful and industrious settlers of newly acquired Russian land, to the consolidation of possession of which they devoted themselves very diligently and quite deliberately.

Next morning, after lively conversations, I parted with the ex-convicts (who at some time in their lives had committed very grave crimes), whom I met for the first time in my life, carrying away the warmest human feelings towards them.

On 26 August I continued my journey from Karabulak; the road still went along the Karatal for eight *versts*, but at the ninth *versta* turned to the south, began to climb the mountain, and after a stage of twenty-four *versts* from Karabulak it reached Dzhangyzagach picket. Having covered a further eighteen *versts*, at first past diorite mountains, and then past a mountain which consisted of porphyry, I crossed a pass into the valley of the river Koksus, the bright ribbon of which appeared before me, sparkling in the sunlight, and bordered by a row of fresh tall poplars. Here I left my carriage at a halt, and set out by myself on horseback seven *versts* downstream along the Koksus, where, as I had heard, there was a rock with some kind of figures or inscriptions. After about two *versts* the quite wide valley of the Koksus grew perceptibly narrower. The bottom of the valley resembled a marvellous park, consisting of poplars, birches, bird-cherry, sea buckthorn and willow, intertwined with Dzhungarian *lomonos* (*Clematis songarica*). The river, wide and rapid, now divided into several branches, now joined into one channel, adorning the park with its silvery aquamarine ribbons. On both sides there arose high mountains in the form of steep and bold rock cliffs, consisting of conglomerate. At the fifth *versta* we crossed a granite ridge, and

<sup>1</sup> This sable-lined ceremonial crown, dating from the late thirteenth or early fourteenth century, but according to legend given to Vladimir Monomakh, Prince of Kiev (1113–25), by his grandfather the Emperor Constantine IX, was used at the coronation of Tsar Ivan IV (1547), and is now displayed in the Moscow Kremlin Treasury. See Smith, *The Russian Crown*.

descending from it, after covering seven *versts*, on the meadow slope to the river we found many individual rocks and on one of them those crude, one might say childish, pictures of animals, about which we had been told. It is remarkable that Spasskii<sup>1</sup> found very similar figures of deer and wild goats on the banks of the Enisei and depicted them in his *Siberian Herald* as far back as 1820. Apparently these pictures took the place of inscriptions and had a conventional hieroglyphic character, but in any case they dated from the 'chudskii' Bronze Age and proved that in prehistoric times the same tribes moved from the banks of the Enisei, skirting the Altai, where they left their traces in the so-called 'chudskii' mines and penetrated to Semirech'e.

I returned to my carriage only after sunset. In the distance, to the east by moonlight the snowy peaks were hardly visible. It was night as we travelled from here for about eighteen to twenty *versts* to Koksu picket, located at the very mouth of a narrow, wild gorge and consisting of a few handsome white little houses. Here, once again, a Cossack settlement had come into existence, and a good bridge had been built across the river.

Koksu settlement was of great interest to me on my way, firstly because it was the third locality of Semirech'e in which I found Russian colonization in Central Asia already firmly established; and secondly because, being near the snowy mountains here, I had an opportunity to undertake from here my second ascent in Semirech'e to the boundary of the perpetual snow.

Taking a good look at the surrounding area on 27 August, I saw before me two mountain groups which reached the boundary of the perpetual snows. One of them resembled in its outline the Dents du Midi,<sup>2</sup> one of the Swiss summits of the Rhone basin, and had snow zones even on its southern slope; the Kirgiz called it Kuiandy. The other group, extending parallel to the first, was separated from it by the wide valley of the river Koktal and showed a high crest, the summits of which were covered with wide zones of everlasting snow on its northern side. It was this ridge, which the Kirgiz called Alaman, I preferred to climb, as the Kuiandy mountain group, which had even more snow on it than Alaman, seemed to me to be inaccessible from the southern side, while the mountains extending to the south-east from Kuiandy, which went far beyond the snow line and had summits covered with a continuous snow mantle, were in a second line beyond Kuiandy and were separated from it by a deep gorge. Besides, the main summit of Alaman was situated in such a way that the view from it on all sides was the most extensive and the most instructive for an explorer of the geography

<sup>1</sup> Grigorii Ivanovich Spasskii (?–1864) trained as a mining engineer, but on going to Siberia became engrossed in its history and archaeology. His researches were published in *Sibirskii vestnik* (1818–25) and *Aziatskii vestnik* (1825–7). Other works appeared in the *Vestnik* and *Zapiski* of the Russian Archaeological and Geographical Societies in the 1850s.

<sup>2</sup> The Dents-du-Midi (3,257 m) overlook St Maurice on the upper Rhone, and were evidently seen by Semenov on his journey from Chillon through the Great St Bernard Pass in 1854.

of the country, and stretched far beyond the Chinese border and beyond the Ili, the most important river of Semirech'e.

The Kirgiz Sultan Adamsart offered to go with me to the top of Alaman, accompanied by a *dzhigit* (skilful horseman), and I took with me only two Cossacks from Koksus settlement. We covered fifteen *versts* on the Sultan's excellent horses along the road from Koksus picket to Tersakan picket, and then forded the rapid river Koktal and began to ascend Alaman. Despite the efforts of the Sultan's excellent horses, the ascent took about four hours. The route went through rocky gorges along a stream, descending like a waterfall. About midday we reached the top of the ridge at a snow clearing, above which a pile of syenite rocks of colossal magnitude towered steeply, the spaces between them filled with coarse-grained snow. All around there was alpine vegetation of Altai type in full blossom. At the top of Alaman ridge I spent four hours collecting plants<sup>1</sup> and samples of rocks and making hypsometric observations, which were successful because my bottle of spirits, which was this time in the care of Adamsart, had not been drunk. My observation gave 3,000 metres for one of the Alaman peaks. At four o'clock in the afternoon we began to descend from Alaman along a different, more direct and easterly route, across steep precipices, past awful abysses. Along the gorge the rocks were covered with Cossack juniper (*Juniperus sabina*), below this zone there appeared honeysuckle (*Lonicera xylosteum*) and bird-cherry trees (*Prunus padus*). As we reached half-way down the slope, the sun started disappearing in the west beyond the level horizon. Adamsart moved aside, quickly jumped off his horse, fell on his knees, took off his conical cap and, turning his face towards the west, uttered his prayers for a few minutes. It was already completely dark when we reached the end of our descent and headed for our lodgings for the night in Adamsart's *aul*. Having galloped six *versts*, we saw

<sup>1</sup> [Semenov:] Here is a list of the plants collected by me that day (27 August) in the alpine zone of the Alaman ridge. Of Ranunculaceae: *Ranunculus altaicus* and another, this time Tian'-Shan's, a beautiful and original type of buttercup with white-grey flowers, related to a special kind, singled out by the botanist Meyer: *Callianthemum alataicum*; *Aconitum rotundifolium*; of Cruciferae: *Draba hirta*, *Chorispora songorica*; of *silenovii* (pinks): the characteristic alpine type *Melandrium apetalum*; of Alsineae: *Cerastium trigynum*; of leguminous plants: newly discovered by me that day, a species which later received the name *Oxytropis cana* n. sp.; of Rosaceae: the Altai species *Sanguisorba alpina*, *Potentilla fragiformis*; of Saxifragaceae: *Saxifraga sibirica* and *S. flagellaris*; of Compositae: Central Asian *Aster flaccidus*, the Alpine *Erigeron uniflorus*, Tian'-Shan' *Waldheimia tomentosa*; of Primulaceae: *Androsace villosa* and *septentrionalis*; of Gentianae: *Gentiana falcata*, *G. aurea*, *G. prostrata*, *G. frigida*; of Boraginaceae: *Eritrichium villosum*; of Scrophulariaceae: *Gymnandra borealis*; of Labiatae: *Dracocephalum peregrinum*; of Liliaceae: *Allium platyspathum*; of sedges (Cyperaceae): *Carex nigra*. The nature of this flora has, of course, great similarity with the vegetation of the alpine zone of the Kopal chain, and generally with the whole Semirechensk Alatau.

Karl Antonovich Meyer (1795–1855), Director of the Imperial Botanical Gardens, Petersburg, published *Verzeichnis der Pflanzen, welche während der 1829–1830 unternommenen Reise im Kaukasus und in Provinzen am westlichen Ufer des kaspischen Meeres gefunden und gesammelt worden sind* (St Petersburg, 1831) and *Verzeichnis der im Jahre 1833 am Saisang-Nor und am Irtysh gesammelten Pflanzen* (St Petersburg, 1841). He also produced inventories of the flora of Tambov and Viatka provinces in 1844 and 1848, respectively.

lights and heard dogs barking and the sound of voices of the Kirgiz, who had come to meet us and were bustling near a large *iurta*, which seemed as it were to be emerging from the row of other *iurty* and moving towards us.

When we went into the *iurta*, which occupied a position on a meadow, we found there rich Tashkent carpets already spread out, prepared for our stay overnight. Soon a friendly fire began to burn in the middle of the *iurta*, which, as I discovered, did not belong to the Sultan, whose residence was still much further away, but to the wealthiest of the inhabitants of this *aul*. Besides those who had come with me, the company around the fire consisted of the owner of the *iurta*, the two most eminent Kirgiz of the *aul* and two *cholokazaki*. To begin with, there appeared *kumys*, then we drank tea, and then mutton, the usual expression of hospitality, was served. The Sultan said his prayers, then we were given beautiful Bukharan copper *kumgany* (wash-hand-basins), and all of us washed our hands and set about our supper, after which the owners of the *iurta* and inhabitants of the *aul* withdrew, and the Sultan and I lay down on the silk pillows which had been prepared for us. The fire went out. Through the aperture at the top of the *iurta* we saw the stars begin to glisten. To the accompaniment of the melancholy and monotonous singing of the Kirgiz guarding the herds which surrounded us, we were soon fast asleep. Only after midnight was I awakened by a dreadful alarm: there could be heard screams of people, a desperate barking of all the dogs of the *aul*, and finally the frightened voices of all the domestic animals of the *aul*: neighing of horses, bellowing of oxen and camels, bleating of sheep, in short, such a wild vocal concert as I have chanced to hear only once in my life. All those who were staying in the *iurta* ran outside, except for me and the Sultan, who was sleeping soundly on his silk pillows and barely roused even after I had woken. A few minutes after that, right by the *iurta*, a loud shot rang out, and I was able to identify the reason for the alarm, since all the Kirgiz, recognizing the night guest, were shouting: 'Aiu, aiu'; it was a bear, which had got into the herd, grazing a few paces away from our *iurta*, which had been moved forward far out from the *aul*. Startled by my Cossack escort's shot, the bear beat a hasty retreat, carrying off only one ram. From the Kirgiz I learnt that the day before at the same hour the *aul* had experienced an attack by a different bear, which, however, had not managed to get off so lightly from the chase. The Kirgiz had surrounded him on all sides and killed him. The trophy of yesterday's victory, a beautiful bear's skin, was brought and spread in front of me and Sultan Adamsart.

On 28 August in the morning, I quickly galloped on a Kirgiz horse to Tersakan picket, which was fifteen *versts* away from the *aul*, got into my carriage, which had been brought from Koksou picket, where it had stayed for the duration of our excursion to Alaman, and continued my journey along the picket road to Vernoe. After a single stage of thirty-eight *versts* I reached Altyn-emel' picket. This picket is remarkable in as much as it lies at the foot of the lower part of

Semirechensk Alatau, right opposite the Altyn-emel' mountain pass, across which the caravan road to Kul'dzha leads. The second stage of that day from Altyn-emel' to Kuiankuz was another twenty-seven *verst*s. The road went across the steppe like an arc, avoiding the extension of Altyn-emel' ridge, and led me after sunset already to Kuiankuz picket, where I stayed overnight.

On the morning of 29 August I quickly covered the stage of twenty-seven *verst*s from Kuiankuz picket to Karachek picket. For the first nineteen *verst*s the road went towards the south-west, crossing a small porphyry ridge, from the top of which in the misty distance I was delighted to catch sight for the first time of the Zailiiskii Alatau,<sup>1</sup> a gigantic mountain range which glittered with its perpetual snow. Karachek picket was located in a hollow, watered by a stream amidst a low group of hills. The stage from Karachek picket to Chingil'dy picket was about thirty *verst*s. For half of the way the road still went over the undulating steppe, across porphyry hills overgrown with bushes of *dzhuzguna* (*Calligonum leucocladum*), which was still covered with its pink flowers at this time of year, but thereafter the steppe became more even and sandy, and acquired a totally grey colouring, as its vegetation cover consisted partly of various wormwoods (*Artemisia martima*, *A. olivieriana*, *A. annua*), but especially of a small, grey-coloured grass, the favourite with cattle, *usteli-pole*, called by the Kirgiz people *ebelek* (*Ceratocarpus arenarius*), which covered the sandy expanses like a thick and continuous carpet; in places on this carpet there stuck out huge leaves of half-dry thorny grass (*eryngo* – *Eryngium macrocalyx*), which still retained its blue heads and was the favourite food of camels. By the evening the colossal Zailiiskii Alatau, which closed off our horizon in the south, became shrouded with the translucent mist of the clouds, the sun sank on the low-lying and level western horizon of the Pri-Balkhash plain, and I stayed overnight at Chingil'dy picket.

On 30 August early in the morning I left this picket, which was only eight *verst*s away from the river Ili, but since the place convenient for crossing this largest river of Semirech'e was situated much further downstream, the stage from the Ili picket became twenty-five *verst*s.

Here amidst the Ili lowlands I felt that I was in an entirely different, peculiar climatic zone of vegetation, used by Kirgiz nomads for their winter camps. The flora and fauna had a character entirely unfamiliar to me.

<sup>1</sup> The Zailiiskii Alatau extends for almost 280 km in an ENE–WSW direction, and is drained by the tributaries of the rivers Ili and Charyn to the east and the rivers Kebin and Chu to the west. Although diverging somewhat at the lateral margins, two distinct ranges were identified, morphologically and geologically separated by the deep valley of the Chilik and the Chok-Kemin. The highest point of the northern range, Talgarnyn-tal-choku, reaches 4,973 metres, and that of the southern, Kungei, Alatau, 4,771 metres above sea level. On the northern flanks of both ridges at the end of the nineteenth century the permanent snow-line stood at about 3,670–3,830 metres. Precipitation and snow-melt on the Zailiiskii Alatau fed streams and irrigation channels flowing towards the steppes near Alma-Ata (Vernyi), but run-off from the southern slopes of the Kungei passed through Lake Issyk-kul' into the Chu system, disappearing in the deserts to the west of Lake Balkhash.

Before me there appeared a multitude of low and tall bushes and types of grass characteristic of this zone, among which I was struck most by a remarkably beautiful type of barberry, covered at this time of year with clusters of big round berries and surpassing the height of a man by two or even three times. This beautiful tall shrub was discovered by the scientist-traveller Leman<sup>1</sup> during his journey to Bukhara and described for the first time under the name of *Berberis integerrima* by the botanist Professor Bunge.<sup>2</sup>

There were an extraordinary number of small bushes. They were: silvery 'acacia' (*Halimodendron argenteum*), two types of *licii* (*Lycium turcomanicum* and *L. ruthenicum*), *kurchavki* (*Atraphaxis spinosa* and *A. lanceolata*), *grebenshiki* (*Tamarix elongata*, *T. hispida*), heliotrope (*Heliotropium europaeum*), *Stellera stachyoides* and so on.

The fauna also presented striking peculiarities. Not to mention wild boar, tigers, snow leopard and porcupine, hiding in the plentiful rushy undergrowth of this zone, one was struck by tortoises (*Testudo horsfieldi*) in abundance and various lizards and snakes, as well as insects and arachnids, of which I saw here for the first time *phalangida* (daddy-long-legs), scorpions and *karakurt*, whose bites, however, were not as dangerous in the autumn as in June. Also particularly numerous were beetles of the family *Tenebrionidae* (*Blaps*, *Prosodes*, *Pimeliini*). Nearer the river there also appeared trees: heterophyllous poplars (*Populus euphratica* and *P. pruinosa*), and also silver *dzhida* (*Elaeagnus angustifolia*).

The nearer we approached towards the Ili picket, the more lively the surroundings became. Incessantly we encountered either long caravans of camels, or lines of carts and carriages transporting soldiers and the first migrants to the Trans-Ili territory. At the picket itself there were no houses built yet: all of it consisted of *iurty*. A little above the picket a large clumsy barge sat in the river. It had been built on the western shore of Lake Balkhash, and I saw its builders who had brought it only a month ago to the Ili picket. Delayed by head-winds they taken two weeks to cross the lake. According to their story, the lake in general was eight metres deep, but in places this depth decreased to four metres. In the middle of

<sup>1</sup> Aleksander Leman (Lehmann) (1814–42) accompanied Baer on the expedition to Novzia Zemlia in 1834, and took part in the Khiva expedition of 1839. His *Reise nach Buchara und Samarkand in den Jahren 1841 und 1842*, was published posthumously by Gelmersen in 1852, while his work on plants was published in St Petersburg in the same year by Bunge as *Beitrag zur Kenntniss der Flora Russlands und der Steppen Centralasiens*.

<sup>2</sup> Aleksander Alekseevich Bunge (1803–90) studied medicine and natural science at Dorpat University and in 1825 went to Siberia with his teacher, Ledebour. From Barnaul they explored the Kolyvan'-Voskresensk mines and made excursions into the Altai. In 1829 he met Humboldt, on whose recommendation he was placed in charge of the Academy of Sciences' mission to Peking in the following year. In 1832 Bunge made his second visit to Altai and on the basis of his findings published several books on the vegetation of China, Mongolia and Altai. Returning to Petersburg in 1833 he was appointed to the Chair of Botany at Kazan' University and travelled extensively through the Volga steppes. In 1836 he became Professor of Botany at Dorpat. In 1857–9 Bunge led an expedition through the Caucasus to Persia.



the lake they came across quite a high island, visible from a distance. Along the river Ili they were towed upstream to the Ili picket, taking two months to cover a distance of 300 *versts*.

The width of the river Ili at the picket was from 300 to 400 metres. Our crossing of the Ili turned out to be rather difficult and took quite a long time. Although the current opposite the Ili picket is not particularly fast, there are quite a lot of dangerous whirlpools. My *tarantas* was transported in rough and ready fashion on a caique, but I had to go across with the Cossacks, swimming on horseback. Moreover, the horse of one of them began to sink; the Cossack was rescued only because we were swimming in a crowd, side by side, and he cleverly managed to transfer to the horse of his neighbour, while his own horse disappeared under the water and emerged only much further downstream.

Having crossed the river, I got into my *tarantas* again, and only had two more stages left to Vernoe (seventy *versts*). The first stage to the Almaty picket at first continued across the characteristic Pri-Ili zone, in which at that time there were a multitude of Kirgiz *auly*, which had descended from the alpine zone with their herds of horses and cattle.

The full tributaries of the Ili, which originate in the perpetual snows of the Zailiiskii Alatau, are still impetuous torrents as they break away from the mountain gorges onto the broad steppe foothills; but they are narrow, very small streams when they reach the river, having lost the bulk of their waters, which are diverted into *aryki* in order to irrigate the fields in the hot Pri-Ili zone (which has an absolute altitude of no more than 300 metres). We forded one such small stream about eight *versts* away from the picket, and hardly recognized it as that wonderful river Talgar, from which the peak of Zailiiskii Alatau (Talgarnyn-tal-choku), which feeds it with its perpetual snows, got its name. We crossed another river, which was no more than an insignificant small stream, within a distance of eight *versts* of the Almaty picket. That was the river (Almaty), which breaks away from the mountain gorges near Vernoe itself.

For the duration of our entire stage from the Ili picket to the Almaty picket we saw before us the colossal Zailiiskii Alatau. This mountain range extends from east to west for more than 200 *versts*, rising at its centre point to a gigantic height. In the very middle of it there rises a three-headed mountain which is more than 4,500 metres above sea level. At the very top of this mountain snow does not stay on the dark, steep cliffs, but on the neighbouring summits there is a lot of snow, at least so that for a hundred-*versts* stretch the middle of the high crest seemed to be covered completely with eternal snow, and only sixty *versts* away to the east and the west of the main peak (Talgarnyn-tal-choku) does the crest of Zailiiskii Alatau fall below the snow line.

As we approached the Almaty picket, evening was drawing on, and all the foothills of Zailiiskii Alatau disappeared in a shroud of dry haze, behind which all the outlines of the range seemed to be a monotonous dark gigantic wall up to

3,000 metres high; but the whole of its snowy crest from 3,000 to 5,000 metres, where there was no longer any mist, and where the atmosphere was completely cloudless and transparent, was illuminated by the rays of the setting sun, which gave a fascinating pink hue to the snow, and was unusually distinctly visible in all its smallest outlines. Nowhere in Europe or Asia have I been able to see so near mountains which were higher, since in the Swiss Alps, in the Caucasus, in Turkestan and even in the higher Tian'-Shan' the gigantic snow crests are visible only from other great altitudes and nowhere reach a height of 4,000–4,500 metres above the viewer, as does the crest of Zailiiskii Alatau where it rises directly above the Ili lowlands.

During our last stage from the Almaty picket to Vernoe (thirty-five *verst*s) it had already become totally dark, and when we began to approach Vernoe, a dark night had set in. It was so much the more effective that, quite unexpectedly, there arose before me the cheery multi-coloured lights of the illumination, which had been lit up that day, across the whole wide expanse of the recently founded fortification, which presented an utterly fairy-like view of Vernoe. I knew that, apart from the small house of the police-officer of the Great Horde, houses did not yet exist in Vernoe, but meanwhile the glittering multi-coloured lanterns designated the beautiful facades of many of these non-existent houses.

However, when I awoke the next day in the spacious *iurta* prepared for me, and emerged from it, there appeared to be no houses and no house facades. It turned out that the evening before, due to the artfully devised illumination, a complete illusion had been created. Only a few of the most prosperous settlers had managed to build foundations for their houses and to lay in timber for them. This consisted of magnificent timber, straight as an arrow, of Tian'-Shan' spruce (*Picea schrenkiana*), which had been brought here from the Almaty valley. The settlers complained only of the fragility of this timber, which split badly; but that happened because, after felling the trees, instead of drying them out beforehand while still in the damp zone of forest vegetation, the settlers transported the trees straight into the unusually dry foothill zone, where at that time there was not a single tree growing, while the luxuriant orchards, in which this garden city now abounds, began to be planted only much later.

At the time of my arrival Colonel Khomentovskii was the police-officer of the Great Horde, and therefore also administrator of the entire Trans-Ili territory. He had done well as a student at the Corps of Pages and with all his gifts would have been an outstanding man, if he had not suffered that shortcoming which paralysed so many of our best people in the outlying districts at that time – alcoholism.

Khomentovskii greeted me very affably, and he and I very soon hit it off on the strength of our Peterhof camp recollections. He informed me that he had the Governor-general's instructions concerning an escort for me, and expressed his

confidence that with my military education I would maintain discipline in the convoy which was placed under my immediate command better than any of his officers. He warned me that at the eastern end of Issyk-kul' I would probably not find anyone, because owing to a prolonged and bloody strife between the neighbouring tribes of Kirgiz people – the Sarybagish (subjects of the Kokand khanate) and Bogintsy (subjects of China) – the latter had fled from Issyk-kul' to the east, while the former had not yet dared to occupy the ancestral Bogintsy lands, that is the eastern half of the Issyk-kul' basin. Of course, one might come across roaming gangs of one or the other party, but Khomentovskii considered all this tribal strife to be a favourable circumstance for my journey, the only hindrance to which was the late time of year.

My expedition to Lake Issyk-kul' was equipped in two days. I had at my disposal ten Cossack escorts, two Kirgiz, three pack-horses and a camel. We left on 2 September towards evening; on our departure from Vernoe we encountered some of the first Russian peasant settlers, who had just arrived in Vernoe, enjoying a *khorovod* (round dance). My team consisted of fourteen people (apart from myself and the ten Cossacks, there were my serf servant and two Kirgiz), but we were joined by two more Cossacks, from among those on indefinite leave, and a youth, who had not yet reached the age for service, but who wished to go with us to the mountains to hunt tigers. In addition, we were accompanied by three officers (Colonel Khomentovskii, artillery Captain Obukh and another artillery officer with their escorts, who were travelling to Kirgiz *auly* temporarily residing by the river Issyk); thus, our whole caravan consisted of thirty people. We made our way straight to the east at the foot of the Zailiiskii Alatau, by daylight at first, and then when the last rays of the sunset had disappeared, by moonlight for two more hours, and having travelled altogether almost twenty-four *verst*s, stopped for the night at the first sizable river (the Talgar), which emerges from the mountain ridge further to the east of Almaty. The place chosen for our overnight stay was where the river Talgar broke away in a rapid torrent from the valley into the foothills.

On 3 September I got up well before sunrise and, accompanied by a Cossack, set off to the nearest hill in order to enjoy the fascinating picture of the morning glow (*Alpenglüh*en) on the snow-covered Talgar group, where we could see through a wide hollow of the Talgar valley. While the low foothills nearest to us, with their soft, rounded outlines, still hardly appeared from under the cover of night, the sharply outlined serrated snow crest with its three-headed giant (Tal-garnyn-tal-choku), rising at the head of the Talgar valley, was already glistening with its eternal snow in the bright purple rays of the sun, which had not yet appeared from over the distant horizon. However, when the bright luminary finally appeared above the mountains, I turned my attention to the immediate surroundings of our overnight bivouac. On its way down to the foothills the Talgar appeared to me to be wider, faster and noisier than the river Biën in the

Semirechensk Alatau. Its banks were overgrown with trees and bushes.<sup>1</sup> The river's boulders consisted of syenite, diorite and diorite porphyry.

We did not get under way before ten o'clock in the morning. The day was very hot. We forded the Talgar with difficulty, and having rapidly travelled for twelve *versts* along the same foothills, reached the Issyk, from Vernoe the second significant river of these foothills, and at its exit from the mountains we settled for our midday snack at about eleven o'clock in the morning. In this place the foothill summits were rounded and did not have any rocky outcrops. The boulders in the river consisted of porphyry and of diorite in small quantities. The river Issyk, on its exit from the mountainous valley is somewhat narrower than the Talgar, though just as rapid, and its valley overgrown thicker than that of the Talgar with trees, among which apple-trees, *uriuk* (apricot-trees) and hawthorn (*Crataegus pinnatifida*) were the principal ones.

The Issyk valley provides one of the best entries into the best areas of the Zailiskii Alatau for views. I had been told so much about the waterfall in the Issyk valley, and about the beautiful alpine 'Green lake' (Dzhasyl-kul'), which was easier to reach through the valley of the Issyk, that, leaving my team at the place of our halt, I decided to make an excursion into the valley accompanied by three escort Cossacks and three hunters.

We left at about noon. At first the valley made straight for the south, between rounded hills. The forests of apple-trees and apricot-trees were becoming thicker and thicker. Soon to the right of us we could see a way into a side valley, where I decided to go with my fellow-travellers, as it was extremely narrow and picturesque. The high, rounded mountains which bordered it rose on both sides one after another, not unlike *coulisses*. They, too, were covered with dense thickets of apple-trees and apricot-trees. In spite of it being autumn, everything in it was fresh and green, as in a beautiful orchard. The apple-trees were covered with ripe apples, but the apricots had already fallen. The climb along the valley was fairly steep and difficult.

The Cossack hunters accompanying us were not disappointed in their expectations, and when we left the zone of fruit trees for the zone of coniferous trees, consisting of slender firs, and then of *archa* (*Juniperus sabina*), we did indeed scare two tigers out of the dense thickets of *archa*. Everyone rushed after them, but, of course, without any chance of success, and having travelled for about three *versts* into the mountains, I decided to turn back with my escorts to the Issyk valley. The Cossack hunters parted with us, wishing to track down the tigers and to continue the hunt, which in their opinion had started so successfully. I returned to the Issyk valley with my escorts and began to climb along it.

<sup>1</sup> [Semenov:] In my diary for 3 September on the Talgar there are mentioned: hawthorn (*Crataegus pinnatifida*), *irgai* (*Cotoneaster* sp.), sea buckthorn (*Hippophae rhamnoides*), *tavolga* (*Spiraea crenata* and *hypericifolia*), sweetbrier (*Rosa geblariana*), *Atrophaxis lanceolata*; and of herbs: steppe sage (*Salvia silvestris*), *Berteroa incana*, *Cichorium intybus* and parasitic *Orobanche amoena*.

The mountains were becoming higher and closer together, and on their slopes in front of us there appeared slender spruce trees (*Picea schrenkiana*). Eventually, at the fifth *versta* there appeared sheer rock cliffs and scree. The rock, of which the mountains edging the valley consisted, turned out to be red, quartz-free porphyry. The tops of the mountains which formed the valley, which further on turned into a narrow gorge, were, however, rounded and cupola-shaped. Almost nothing but porphyry was found in the scree and boulders either, and only now and then we found pink or white and black syenites. Four times we had to ford the furious Issyk in order to get round sheer rocks, rising now on one, now on the other bank of the river. The fords were deep and extremely dangerous, since in the swiftest places of the impetuous torrent the horses, if they stumbled on submerged rocks, could easily be brought down and carried away by the foaming waves. In one place such a wave did topple one of our horses, which stumbled on a submerged rock. Fortunately, the Cossack riding it managed to jump off on to a rock, which was not flooded by the waves of the swift current, and we soon managed to pull the horse, which had become stuck among the rocks near the bank, out of the water. At last, at the end of the wild gorge a waterfall, descending like a wide silvery ribbon, came into view. The whole Issyk, like the Giessbach<sup>1</sup> in Switzerland, rushed from a long slope along ledges into a deep gorge, and only its top burst in a waterfall through a rocky cavity, picturesquely bordered with dark green fir-trees, which stuck out from rocky porphyry cliffs, partly covered with the dark verdure of *archa*.

We were not able to get to the 'Green lake' during this visit, as there remained a few more *versts* of the difficult climb, and the sun was already hidden behind the high mountains. I visited Lake Dzhasyl-kul' only the next year (1857), but that day I hurried to return to our camp (at the Issyk's exit from the mountains), which we reached by moonlight. I found the officers, who were travelling with me, here at the lodging for the night after completing a horseback tour of the Kirgiz *auly*.

I was not in a hurry with my departure next day, as the traverse I was faced with that day was the easiest. Having satisfied myself during our tiger-hunt, and also during our four crossings of the Issyk, that the Cossacks' horses were totally unsuitable for mountain travelling, I decided, come what may, to exchange all my horses for my two-week expedition for fresh ones from such Kirgiz of the Great Horde as could be considered mountaineers, as during the summer season they kept their herds on the most inaccessible heights of the Zailiiskii Alatau. I was able to find such *auly*, on Colonel Khomentovskii's directions, on the river Turgen, which was only fifteen *versts* away from the Issyk.

On 4 September, having got up rather late after the tiring travels of the previous day, I learned about the sad outcome of the tiger hunt, at the beginning of

<sup>1</sup> Giessbach Falls, on the southern flank of Lake Brienz, were already among the most prominent Swiss tourist attractions from 1818. The first guest-house followed in 1840 and by the 1870s post-cards advertised steamer excursions to view the falls from the lake.

which we tried to participate. Going in pursuit of the tigers, the three hunters eventually came upon their tracks, which in one place diverged, since obviously the two tigers ran off along different paths. One of the two older, more experienced hunters set off along the upper path with a dog, and the other equally experienced old Cossack went along the other path with the youth, who had never before been on a tiger hunt. Neither party lost sight of the other. Unfortunately, the Cossack who was going along the lower path without a dog noticed a tiger lurking in the bushes, only too late to have time to shoot at it. The tiger threw itself upon the hunter so swiftly that with a blow of its paw it knocked the rifle from his hands. Keeping his composure, the experienced hunter stood facing the tiger, which in its turn also stopped and lay down before the hunter like a cat that lies in front of a mouse when it stops moving. The young Cossack hurried to the rescue of his friend, but his hands became so frozen with fear that he was unable to shoot. Then the older Cossack demanded that he pass him his own rifle, but this, too, the young Cossack was unable to do; the old Cossack turned and took two or three steps in order to take his rifle from the young man. At that moment the tiger threw itself upon its prey and grasping the Cossack by his shoulder, carried him forward with a strong movement, as it noticed the third Cossack, who was going along the upper track, running quickly across its path. The tiger had already crossed the point of the intersection of the paths, but the dog managed to catch up with it and to seize it by the back. Then the tiger, having left its prey, ran forward a little and started to circle around in order to throw off and to tear in pieces its small enemy; and that was what he finally succeeded in doing, but at this moment it was struck by two lethal shots from the hunter who had been pursuing it; however, it still had enough strength to go down to the stream, to have a drink in it and to breathe its last on the bank. But the victorious marksman was no longer concerned with the tiger; he rushed to the help of his friend, who had one arm gnawed through above the elbow, while two fingers on the other hand had been badly damaged. The two Cossacks carried their colleague in their arms over to the place where they had left their horses, and then with their help they reached our bivouac on the Issyk. With difficulty the victim was transferred to Vernoe, where I visited him in hospital only after my return from my two trips to Issyk-kul' and found him recovering, although he had already had his arm amputated. The trophy of their hunt, a beautiful tiger's skin, was given to me, and the hunter who killed the tiger magnanimously let his maimed comrade have the sum of money I gave him.

On 4 September at ten o'clock in the morning, having said goodbye to Khomentovskii and to the artillery officers, and this time accompanied only by my Cossack escorts, I quickly covered the ten-*versts* distance between the Issyk and the next easterly important river, the Turgen. We came to the Turgen at the place where it had eroded a deep hollow for itself as it left the mountain valley for the foothills. Its bed was filled with boulders of porphyry and syenite, its current was

rapid and noisy, its waves foamed, as it leaped over the submerged rocks. In the river there were many alluvial islands, heaped up with boulders; the width of the river was the same as that of the Talgar, and at its exit from the mountains the ford was very difficult for our weak horses. An *aul*, where we could hire fresh horses, was located five *versts* below the place at which we came out; it belonged to the rich *bai*, Atamkul, who was renowned for being one of the bravest heroes of the Great Kirgiz Horde. I succeeded in getting fifteen excellent horses, accustomed to mountain travel, for two weeks with two guides, for two sheep per horse, but the horses could be gathered together only by late evening, and I stayed for the night in the *iurta* offered to me by the hospitable Atamkul. The camel, provided by Khomentovskii for my expedition, was unanimously agreed to be suitable for mountain journeys.

On 5 September I began the journey with my escort at seven o'clock in the morning. After an hour's travel towards the south from Atamkul's *aul*, upstream along the Turgen, the hollow of this river had turned already into a valley. Its lateral hills had a rounded outline and consisted of dark argillaceous schist, of sandy alluvia and of yellowish clay, with boulders mainly of porphyry. In places these boulders were piled up in heaps, like erratic blocks, high above the level of the present river.

Unfortunately, I did not have enough time at my disposal for an investigation of the reasons for these boulders' being on these elevations, and, not yet having had an opportunity to make certain of the existence of glaciers in the Tian'-Shan' mountain system, I could ascribe the presence of these boulders at considerable heights only to the fact that the river originally flowed across the valley in a wider bed and at a higher level, but by gradually eroding a deeper bed for itself in the friable deposits of the foothills, it had already parted for ever from its previous higher course, leaving on its old banks whole ridges of boulders, which it could not carry away from their high, but by now inaccessible, level.

At the Turgen's entry to the valley, a small stream, which we crossed, discharged into it on its right-hand side. After an hour's journey from this stream there appeared on both sides of the river the first outcrops of rocks, which consisted of porphyry on the right bank, whereas on the left one, high above the level of the river, ridges of boulders were still found in large quantities. Along the slopes of the valley there were growing bushes of *cherganak* (*Berberis heteropoda*) with its black, rounded and tasty berries, buckthorn also with black berries, and *kurchavka* (*Atraphaxis spinosa*), still covered with pink flowers, and nearer the river bed willow (*Salix purpurea* and *S. fragilis*). But all the grasses we came across belonged to the cultivated zone of the Zailiiskii Alatau and had a European character.<sup>1</sup>

<sup>1</sup> [Semenov:] In my diary for 5 September there were noted in the Turgen valley: *Berteroa incana*, *Geranium pratense*, *Trifolium repens*, *Epilobium palustra*, *Aster tripolium*, *A. sedifolius* (*Galatella punctata*), *Achillea millefolium*, *Salvia silvestris*, *Veronica beccabunga*, *Plantago major*, all common plants of the European flora.

The Turgen valley was gradually becoming narrower and more picturesque and further overgrown with apple-trees, apricot-trees, poplars, hawthorn and the maple which was later named after me, and slender fir-trees appeared on the mountain slopes, where they were descending to the valley. Twice we had to ford the river, in order to steer clear of the overhanging rocks. After three hours of travel the valley, going in a south-easterly direction, suddenly forked; the smaller of the river's branches was coming directly from the south, that is from the transverse valley, and the larger one from the east, from the longitudinal valley.

It was into the latter that we turned and here at first we came upon outcrops of gypsum and, further along, a dark variety of porphyry. Our route went upstream along the valley for a long time, but little by little it moved away from it, climbing steeply up the mountain. After four hours travelling the road, which had moved away from the river, started going up to a mountain pass. The ascent was very steep. Granites appeared in small outcrops too, but then there were stretches of porphyry again. After the pass we came down to another river, also one of the sources of the Turgen, the left bank of which was covered with spruce-trees. Then we climbed again, but this second pass also brought us to yet another of the Turgen's sources, which was flowing eastwards at first, and then turning in an arc initially to the east and then to the west, carving its way along the valley, across which to the north-west of us we could see, covered with continuous perpetual snow, the entire crest of the northern chain of the Zailiiskii Alatau, while the mountain crests of porphyry, through which our pass was going, had only belts of perpetual snow on them. The passes we crossed were already in the alpine vegetation zone, while the hollows of the upstream tributaries of the Turgen were in the coniferous forest zone.

From the same upstream tributary, which turned in a full arc westwards, we climbed up the last and highest pass, which the Kirgiz called Asyn'tau. Beyond this pass we came down to the river Asy (Asy-su), which flows to the east along a continuation of the same longitudinal valley, along which we climbed the Asyn'tau, and stopped here for the night. The thermometer showed 7° here at eight o'clock in the evening.

Our camp turned out to be at 2,390 metres above sea level, but it was about 500 metres lower than the last pass, and yet even near our camp the vegetation had an alpine character. Migration of plants of the alpine zone into the low forested and cultivated zones along the mountain streams, which retain their low temperature due to the rapidity of their currents, is a phenomenon which I noticed many times on the northern slope of the Zailiiskii Alatau, and it is explained by the fact that seeds of alpine plants, which find opportune conditions of development in places where the soil obtains constant irrigation from always equally cold streams, are carried over from the alpine zone by the waters of those streams.



From Atamkul's *auly* we had made no less than sixty *verst*s of a very difficult traverse, which was accessible only to the horses of Kirgiz mountaineers.

On the morning of 6 September, there was hoar-frost. At eight o'clock in the morning we left our overnight camp for the river Asy and set out eastwards along its longitudinal valley. A quarter of an hour later we forded the river, and after two hours, when the valley suddenly became wider, we deviated from the Asy-su at the place near its bank where there was a Kirgiz grave in the form of a conical tower built of sun-dried brick, with a window, surrounded by a small balcony. Leaving the river, we began to climb along an inclined plane, which was covered with dark coniferous forest. After a quarter of an hour of climbing we came into a wild gorge, along which a stream, which fell into the Asy, forced its way. The right side of the ravine was covered with spruce-trees, and the left side with *archa* (*Juniperus pseudosabina*). The gorge was rocky; the outcrops which we encountered at first consisted of metamorphic rocks, and further on of syenite, like all of the ridge which we were ascending. The climb was so steep that our camel became exhausted, and after the second hour's ascent we had to make a one-hour stop. It was not without reason that the Kirgiz people called this pass Dzhamanbastan (the Evil Way).

After our halt we climbed for another hour and a half until we came out into the alpine zone; and then reached the top of the pass. On its northern side in a small hollow there were visible the remains of snow which had not quite melted during the whole summer season, and towards the end of our climb snow was falling upon us in the form of granules from a small cloud which had built up, but when we reached the top, from which there arose a picturesque ridge of rock, a gusty wind dispersed the clouds, and an extensive view of the whole southern chain of the Zailiiskii Alatau opened up before us. To our right it stretched in a continuous crest of snowy summits without any indentations; in front of us there arose mountains, on which there were visible only patches and strips of perpetual snow, while to the left the whole ridge rapidly became lower and smoother at the place where our guides pointed out the lowest of the passes of this range, calling it Santash. The summit of our pass, however, had high alpine vegetation. The space between us and the southern chain of the Zailiiskii Alatau was very wide and was filled with some parallel ridges, which looked like garden beds from the enormous height at which we stood.

The descent from the mountain pass was steep and quick, along a small spring, which our Kirgiz called Chin-bulak,<sup>1</sup> the gorges of which were covered with spruce-trees on one side, while cliffs full of syenite abounded on the other.<sup>2</sup> Leaving the small stream, we descended towards the south-east, and then to the south, and having crossed over to a big granite ridge, we came out, by now in the

<sup>1</sup> Kosharov no. 65.

<sup>2</sup> Kosharov no. 125 (4).

twilight, into a valley along which the river Dzhenishke was flowing eastwards. Having forded this river, we camped overnight on its right bank, among dense thickets of poplars and *cherganak* (*Berberis heteropoda*), intertwined with *lomonos* (*Clematis songarica*). Above us some diorite rocks jutted out. In the twilight the cliffs of the left bank seemed to me to be like ruins of an old fortress with loop-holes.

On 7 September in the morning I satisfied myself that these cliffs consisted of absolutely horizontal layers of weakly cemented sandstone, which included a large quantity of huge and small boulders, among which porphyries were the main element, and then diorites and syenites. In this conglomerate there were quite a few caves.

After leaving our overnight camp at eight o'clock in the morning, we journeyed down the river Dzhenishke for about an hour, and then started climbing towards the south-east to a new pass. The place at which we departed from the river was remarkable for the fact that its valley was turning into a type of gorge, restricted by sheer rocks. These rocks consisted of a very hard conglomerate, under which I found real crystalline rocks, namely very coarse-grained granite, very much weathered, however. Having parted from the river, we began to cross gentle *uvaly*, on which we met a big wolf, but could not catch up with it.

After continuing for two and a half hours across these *uvaly*, at last we saw the valley of the most significant of the rivers originating in the Zailiiskii Alatau, namely the Chilik, which was bordered here by quite high, but gently sloping hills, covered with herbaceous vegetation. Above the place where we reached to the Chilik, this river from its uppermost reaches flows from west to east along the most sizeable valley of the Zailiiskii Alatau, separating the northern of its two parallel ranges from the southern. At the place where we saw it for the first time, the Chilik appeared as a full, wide and noisy river, rushing stormily across the rapids caused by the rocks, which were piled up by it. Its banks had become covered with thick forest, which consisted of poplars (*Populus suaveolens*), types of *tal* (*Salix purpurea* and *S. fragilis*), sea buckthorn (*Hippophae rhamnoides*), *cherganak* (*Berberis heteropoda*), *argai* (*Cotoneaster* sp.) and other bushes. We wandered about in these thickets for more than half an hour before finding a ford across the river. In one place, almost from under my horse, a Siberian stag (*Cervus canadensis asiaticus*), 'bugu' in the Kirgiz language, sprang out with its huge branching antlers. The ford was wide, deep and extremely dangerous; only our experienced Kirgiz mountain horses could withstand the crossing. There were many conglomerates and breccias among the huge boulders carried down by the rapid river.

Beyond the Chilik we headed south-east across a fairly smooth steppe plateau, very slowly but gradually rising in the direction of our route. We went along this high steppe for about five hours, without meeting any flowing water, but we came across multitudes of light-footed and beautiful wild goats (*Capra sibirica*),

running across these steppes in small herds. The Kirgiz call this plateau Uch-Merke (Three Merke), after the name of three rivers, which have eroded incredibly deep valleys for themselves in the high plateau. As it rose towards the south, it was as though the southern range of the Zailiiskii Alatau had merged with it, and on the distant horizon, in the brilliance of the sun's rays, I saw for the first time what had been for many years the goal of my plans and aspirations, the continuous snowy Tian'-Shan' range, which my guides called Mustag.<sup>1</sup> The gigantic ridge was sharply distinguished from the nearer southern range of the Zailiiskii Alatau, on which only strips of perpetual snow were visible in front of me; but soon a gusty wind covered the mountain crest nearest to us with clouds, and when the same wind swept away these clouds, the peaks of this crest too had already been covered with fresh snow.

After five hours' travel from the Chilik our way across the plateau was suddenly blocked by a deep hollow, cut into it by the first Merke. The depth of this typical valley, etched into the plateau no less than 300 metres below its surface, gave me a graphic appreciation of the height of the plateau. The sides of the valley, along which we had to descend, were very steep and consisted of those typical conglomerates, of which the entire plateau was apparently composed and which contained huge boulders of porphyry, syenite, diorite and other crystalline rocks, fairly weakly cemented with sandstone. The valley was half a *versta* wide; along its bottom there flowed a rapid, quite sizable, full river, on the banks of which there was not a single tree. We made a one-hour halt here, and then climbed up the other side of the valley along just as steep and rocky a slope, which consisted of the same conglomerates, again onto a flat plateau, interrupted by a deep valley, and after an hour's journey across the plateau we reached the second Merke, which had incised almost as deep a valley here as the first one.

On the edge of the river valley arose a Kirgiz cemetery. Here among the graves we noticed a grave-digger, a light grey, small Tian'-Shan' bear (*Ursus arctos leuconyx*). Having scared him off, we started in pursuit of him. He ran unusually quickly, and without a backward glance, going down to the valley of the second Merke, and amusingly turning head over heels on steep slopes. Since I had the best horse, I dogged his heels, but my escorting Cossacks were little by little falling behind me. Only one of them turned off and with exceptional presence of mind came down to the valley via the shortest route in order to be in time to cross the bear's path. The Cossack's manoeuvre succeeded. When I reached the bottom of the valley, following at the bear's heels, I saw the Cossack standing before us with a rifle in his hands in complete readiness. The bear ran very fast

<sup>1</sup> Mustag-Ata granitic massif in the eastern Pamir, south-east of Kara-kul', rises to 7,555 metres above sea level. Extensive snow fields and glaciers in its south-western flanks include the Przhval'skii Glacier which stretches for more than 12 km and reaches an altitude of over 4,000 metres. Even in mid-summer, snow often lies at 5,000 metres on its north-eastern slopes and up to 6,000 metres on the south-western ones.

about one hundred paces ahead of me, but when he noticed the Cossack in front of him, he began walking very slowly, with a lumbering gait. By chance I had neither a rifle nor a pistol, and I could only look on with curiosity at the outcome of our pursuit, the more so as the rest of the Cossack convoy had fallen far behind us. At last the bear came alongside the Cossack, but he, instead of taking a shot, moved backwards and let it go past him. The bear passed by its timid foe ponderously and quietly, and then after glancing back, took to its heels with incredible speed. As for me, I galloped to the Cossack and asked him why, having been in such a favourable position for a hunter, he had not shot at the bear, and received the answer: 'Yes, I was quite ready and took good aim, but when I looked at the bear near me and thought: 'What if it eats me?', I lost heart, it went by me, and then it ran off'.

On the bank of the second Merke we were delighted to find a group of willows (*Salix purpurea* and *S. fragilis*) and it was among these trees that we settled for the night on the very bank of the river. Half a *versta* below our bivouac the second Merke was bursting into a wild gorge, forcing its way past outcrops and making small waterfalls or rapids across the rocks, which consisted of hard and clear porphyry.

On 8 September at seven o'clock in the morning we left our overnight camp on the second Merke and set out along a steep slope from the valley to the plateau. Travelling across it south-eastwards for three-quarters of an hour, we reached the valley of the third Merke. This valley, just as deep as the valley of the second one, had a width of half a *versta* and slopes that, though steep, were covered with turf. One *versta* below the place where we forded the river, the third Merke was forcing its way just like the second one, through a gorge. From our crossing we did not turn downstream but went upstream. In an hour and a half the valley turned into a narrow gorge with steep porphyry cliffs and slopes overgrown with fir forest. Steering clear of this ravine, we climbed its right bank and made a two-hour circuit of it, and then came out again into the widening valley, the slopes of which were covered with turf.

After three hours' travel from the place of our overnight stay, the third Merke divided into two branches, one of which flowed from the south, and the other from the south-west. We went along the first one; in one hour we entered a spruce forest, partly covering the valley's slopes, which consisted of diabase. Five hours' journey from our overnight camp the river divided again. After this bifurcation we went along its western branch and began to go steeply uphill, following one of the upper streams of the third Merke, but after half an hour we made a one-hour halt, owing to the extreme fatigue of our camel. Here the outcrops consisted of metamorphosed limestone with veins of limestone spar. Already from the start of our ascent we had emerged from the forest zone; the bushes were subalpine: *archa* (*Juniperus pseudosabina*), four types of currant (*Ribes diacantha*, *heterotrichum*, *atropurpureum* and *rubrum*), Tatar honey-suckle (*Lonicera*

*tatarica*) and a subtle, delicate type of *beresklet*, which was later named after me (*Euonymus semenowi*). Then we went through meadows with high alpine vegetation<sup>1</sup> and finally we reached the top of the mountain pass on which snow still lay until the beginning of July, but had already melted by the end of that month and did not last into August. The height of this pass was no less than 2,500 metres, but nevertheless it seemed to me to be lower than the Asynyn-tau. My guides called this mountain pass 'Tabul'gaty'. The outcrops on it consisted of granite.<sup>2</sup> From here two rivers were flowing in different directions: one southwards, into the Issyk-kul' basin; the other northwards into the Merke, which belonged to the basin of the river Ili. Both had one and the same name Tabul'ga-su.

Along a very steep slope we came down into the valley of the southern Tabul'ga-su, which was overgrown with well-proportioned spruce trees. Beginning with the pass over the crest, during our descent I was able to enjoy constantly a wonderful panorama of the entire Tian'-Shan' between the meridians of the famous Musart mountain pass and the western extremities of Lake Issyk-kul'.

Unfortunately, I could not orientate myself in this splendid panorama, since my guides (though Kirgiz of the Great Horde), who were well acquainted with the Zailiiskii Alatau, were totally unfamiliar with the Tian'-Shan'. To the left of our meridian in the middle of an extensive group of snowy giants there was a mountain of pyramidal shape, distinguished by the boldness of its outlines, the slopes of which were so steep that in some places the snow could not hold, but in spite of that the pyramid seemed to be snow-white, especially as right from its base, which was in the middle of the other giants of the mountain group, it was already situated in the zone of permanent frost. To the left of this very prominent mountain there was yet another, which rose in a gentler cone, but yielded to it in height, perhaps because it was further away. A little further to the right from our meridian towards the south-west, our attention was attracted by a three-headed giant, which resembled the Dents du Midi in the Valais Alps in shape, but was all covered with a cloak of snow.

<sup>1</sup> [Semenov:] Here is a list of plants, collected by me in the alpine zone of Tabul'gaty pass on 8 September 1856: of Ranunculaceae: Kashmir *Anemone falconeri*. It is remarkable that that day on the Tabul'gaty pass I found one more western Himalayan plant; *Carum indicum* (according to the identification of Regel and Herder), brought apparently from Kashmir, *t. Roylem*, and described by the botanist Lindley.\* On the same day I also collected European forms: *Moehringia lateriflora*, *Cerastium alpinum*, *Aster alpinus*, *Erigeron uniflorus*, *Gentiana aurea* and *Veratrum album*, the Arctic form of *Gymnandra borealis*, the Altai *Doronicum oblongifolium*, and from the local Central Asian species: *Chrysanthemum pulchellum*, *Eritrichium pectinatum*, and *Nepeta densiflora*.

\* John Lindley (1799–1865) was educated in Norwich, where the former head of the Grammar School was William Jackson Hooker, under whom he later studied botany, and by whom he was introduced to Sir Joseph Banks. From 1829 he was the first Professor of Botany at the University of London, and was largely responsible for the colonial department in the International Exhibition of 1862. In 1828 he was elected a Fellow of the Royal Society and in 1857 was awarded its Royal Medal.

<sup>2</sup> Kosharov no. 125 (2).

After descending from the Tabul'gaty pass, we chose a camp for the night at the river Tabul'ga-su's exit from the valley, transversal to the axis of the range; we came down this valley from the pass into a longitudinal valley, that is parallel to the axis of the range, which separated the low foothills from it. The place which I chose for the overnight stay was very well protected by foothills on one side and by forest thickets on the other, and was situated at the very bank of the rapid river, where it was rushing over the rocks and to the sound of which one could drop off to sleep so sweetly. From here the mountain pass of Tabul'gaty, which was 1,010 metres above us, seemed to be a mere speck.

As we had arrived at our camp-site not later than four o'clock in the afternoon and the sun was still high, I left my escorts to pitch the tent, to make a fire, to make tea and to prepare a modest supper, which consisted of dried bread, soaked in water and fried with the fat of a sheep's tail (since I never took any kind of canned food for my travels), and galloped with one of the Cossacks to the nearest knoll of the foothills, from where I could have an unobstructed view of Issyk-kul', the length of which stretched for more than 150 *versts* to the west-south-west.

From the south the whole of this blue basin of Issyk-kul' was enclosed by an unbroken chain of snow giants. The Tian'-Shan' appeared as a steep wall.<sup>1</sup> The snow peaks, with which it was crowned, formed a chain, unbroken anywhere, since their snow-free lower slopes were hidden below the horizon, due to their being so far distant in the south-west, and they seemed to be coming directly out of the dark blue waters of the lake. Having returned to my tent, I fell asleep particularly well under the impression of the pictures of nature I had seen, and to the sound of the river, falling in cascades.

On 9 September we left our camp on the Tabul'ga-su at seven o'clock in the morning and set off towards Issyk-kul'. For more than an hour we followed the longitudinal valley, extending from east to west parallel to the river Tiup and separated from it by a low mountain ridge. There was no river flowing through this valley, since the Tabul'ga went across the ridge's path. On the northern side of the valley was that rounded hill which I had climbed the previous day in order to view the lake.

After an hour's journey, the ridge which bordered the valley from the south smoothed out, and after a short descent we found ourselves in a wide steppe valley, across which the rivers Tiup and Dzargalan, the abundant eastern tributaries of Issyk-kul', flowed westwards in parallel; the first of them (Tiup) gathers together all the rivers flowing from the north, which originate in of the southern chain of the Zailiiskii Alatau (this does not reach the snow-line here), which we

<sup>1</sup> Semenov thought the Kungei Alatau ridge, bordering Issyk-kul' to the north, to be the southern chain of the Zailiiskii Alatau, and called the high Terskei Alatau and the high mountain junctions (Ak-shyirak, Khan-tengri, etc.), situated behind it, the Tian'-Shan'. One must bear this in mind when reading his subsequent account of his journey across the Tian'-Shan'.

had crossed the day before at the Tabul'gaty Pass. And Dzhargalan, the second of the mountain tributaries of Issyk-kul', collects up all the rivers flowing from the south and originating in the frontal chain of the Tian'-Shan'.

We were travelling across the Tiup-Dzhargalan plain directly westwards, along the foothills of the southern chain of the Zailiiskii Alatau, at some distance from them, but nearer to them than to the Tiup. The Tiup-Dzhargalan valley was at least twenty *versts* wide, and behind it was a gigantic range, the foremost mountains of which here and there had snow zones on their peaks, while the rear giants made up a continuous row of snow *belki*. The Tiup-Dzhargalan steppe or plain was raised very little above the lake, and hence, having walked across it for an hour, I stopped at a transverse stream for a hypsometric measurement. It was half past nine in the morning. The thermometer showed 10°C, the weather was a little dull and slightly misty, with low easterly and higher westerly winds.

Continuing on our way, we frequently crossed transverse streams, the Tiup's tributaries, of which there were in all no fewer than twenty-five. The mountains, as their spurs intruded into the valley, seemed to be now closer, now further away from us. The steppe was treeless, and its herbaceous vegetation had the steppe character of the foothill plain of the Trans-Ili territory and of the European Sarmatian plain. *Chii* (*Lasiagrostis splendens*), steppe sage (*Salvia silvestris*), *medunka* (*Medicago falcata*), milfoil (*Achillea millifolium*), *kasatika* (*Iris gueldenstaediana*) and aster (*Galatella punctata*) were the predominant plants of the whole steppe. In some places we encountered marshy areas, overgrown with tall rushes (*Phragmites communis*), among which we noticed the tracks of wild boar. Over and over again we put up Semirechensk pheasants (*Phasianus mongolicus*), which the Cossacks could not shoot with their rifles, loaded with bullets.

After three hours travelling from the stream, by which we made a halt, we approached a mountain spur, which projected into the valley and almost barred our path, which had to go round it. The mountain consisted of finely-grained granite. Climbing it with one of the Cossacks, I could see the entire lake and the wide mouth of the Tiup in front of us. From here to Issyk-kul' there remained no more than eight *versts*. We soon came off the road, making straight for the lake, and in about an hour and a half we reached its shore. The place at which we came out to the lake jutted out into it like a peninsula, or, rather, a spit between the mouths of the Tiup and the Dzhargalan. With its sandy soil the entire peninsula was thickly covered with only one shrub, sea buckthorn (*Hippophae rhamnoides*).

The lake's water looked beautiful with its transparency and light blue colour, but it was salty and unsuitable for drinking. The waves broke steeply. On the sandy shore there were no boulders, except for pieces of loose conglomerate, formed by the lake itself, and not rounded off as either boulders or pebbles. The shells I found on the shore belonged to a new species of the fresh-water genus

Limnaea (*L. obliquata*). The Tiup's width was greater than that of the Rhone at its mouth in Lake Geneva. Westwards the lake seemed to be boundless. On its northern side, twenty to thirty *verst*s away, a high mountain buttress jutted out into the Kungei valley<sup>1</sup> and came near the lake, assisting in the formation of beautiful bays. There were no islands at all in the lake. On the Tiup's bank, about five or six *verst*s above its mouth, there towered a remarkable structure, easily visible from the road. It was a *mulla* (a Kirgiz grave). The edifice was solidly built of sun-baked grey brick, had a cupola and two slender towers, like minarets, joined by a high wall with narrow windows like loop-holes.

We reached Issyk-kul' at four o'clock in the afternoon and would gladly have stayed until the next day, but to spend the night on the lake's shore was too dangerous. A bivouac on the peninsula would have been most unsuitable. Our lights would have been visible from everywhere on both sides of Issyk-kul' (Kungei and Terskei), and it would have been all too easy to cut us off from communication. Our arrival at Issyk-kul' might already be known to the Karakirgiz, because in the morning we had seen one horseman in the distance. The path to the *mulla* with freshly beaten tracks proved that it was visited quite frequently. On our way we had come across the remnants of destroyed *iurty* in large numbers; here, this spring raids and bloody battles had taken place between the two Karakirgiz tribes. Since the victory fell to the more aggressive Sarybagish, they could be spending the night on Kungei, behind the mountain buttress. Any passing raiding party would notice our lights. That is why I decided not to stay overnight here but to go back to our previous site. The Cossacks cheered up, and the three Kirgiz, who accompanied us, and who with much effort had been leading our camel and pack horses, diligently set off at a trot.

Soon we reached the mountain buttress, which we had passed, jutting out on the road. Climbing the mountain, I could once more take a farewell glance at the wonderful surface of Issyk-kul'. A bright stream showed up silver across its surface under the dying rays of the sun, which soon sank in a haze of evening fog. Soon, it was quite dark. It only remained for us either to spend the night in some side gorge or to return to our previous camp. Despite the tiredness of men and horses, we chose the latter. The night was moonless, and even without stars; the sky was covered with dark clouds, and the outlines of the mountains were obscured by fog. We went at a fast trot in a tight group, like a Kirgiz *baranta*, for four hours. Frequently we had to ford the numerous streams running from the mountains. Soon, we completely lost the road or path and had to cling to the mountain slopes in order not to lose our way entirely, and not lose our direction in the wide steppe of the Tiup. At last our camel, tired by the forced march,

<sup>1</sup> Semenov called the northern coastal zone of Issyk-kul', and not the ridge, Kungei; similarly he gave the name Terskei to the southern coastal zone of the lake and not to the enormous ridge which bounded the Issyk-kul' basin on the south.



stopped. There was nothing we could do. We climbed the slope and dismounted from the horses. The wind was extremely strong and piercing, the temperature had dropped below zero. At first it drizzled, and then it began snowing in large flakes. Without unsaddling the horses, having unloaded only the camel, we lay down on the damp ground, covering ourselves with whatever came to hand. The Cossacks were so tired and so chilled that I forbade them to pitch a tent for me. There was nothing with which to make a fire, and besides the place of our halt was too exposed and dangerous. Being tired, I fell asleep for a while, but in an hour woke up under the influence of the piercing and unbearable cold. It was the dead of night. The clouds dispersed a little, and here and there the stars began to shine. I decided to rouse the Cossacks and to seek an escape from the cold by getting on the move again. The camel, which was somewhat rested, was loaded again. I went ahead with one Cossack, and luckily soon found the road. In about three hours of difficult travel, eventually we reached the Tabul'ga-su gorge, which was well protected by a mountain on the east, and by a small grove on the west. Joyously I heard the welcoming sound of the familiar stream. Across patches of soft snow, lying here and there, we reached a ford and, having crossed the stream, spent the night at our former site, pitching a tent there and making a huge camp fire which was invisible from all sides.

On 10 September we left our camp at ten o'clock in the morning and made our way along the valley towards the east. The mountain cliffs, which bounded the valley on the north, consisted of dense grey limestone with traces of fossils: shells, corals, fossil crinoids and ortho-ceratites of the Carboniferous system. We forded the Tabul'ga-su and soon came out to the river Tiup, into which it discharges. The Tiup here flows from east to west, and only on joining with the Tabul'ga does it force its way through the ridge and move away to another parallel valley.

The valley across which we were travelling upstream for three or four hours was picturesque and attractive. Its width was about one *versta*, its floor was overgrown with willow (*Salix viminalis*); the river was wide and fast; fir-trees grew on all the slopes, on which there were also many bird-cherry trees (*Prunus padus*) and *cherganak* (*Berberis heteropoda*); in short, the vegetation was very rich. The mountains bordering the plain were not high, but had beautiful wavy outlines; their summits were covered with snow, which had fallen the day before. The mountain cliffs were extremely interesting. The limestone appeared here in such small outcrops that it was impossible to note its extent, but it rested on a dense metamorphic sandstone, which extended from the north-west to the south-east, with a 40° deviation from the meridian, and a dip of 45° to the south-west. All this was intruded with conglomerates and breccias, composed of huge blocks of the same limestone, sandstone and red porphyry, tightly cemented by a finer-grained mass. Obviously, the rock forcing through here is red porphyry, which

forms rods in sedimentary rocks. Further on, the same limestones stretched along the whole valley. Finally, the valley ended by widening up to four *verst*s, creating a locality very suitable for colonization.

From here we turned towards the north-north-east, crossed an easy pass and entered a wide valley, which had a meridional direction, and in which there was no river, but only a small lake and marsh. On the left, that is western, side of the valley, the sandstone appeared with the same extent and dip as previously. Then we made our way directly towards the north and went uphill a little onto a lowered continuation of the southern chain of the Zailiiskii Alatau; we crossed it for three or four hours and finally came out onto the Dzhalanash (Uch-Merke) plateau. Ahead, there appeared before us a row of poplars (*Populus suaveolens*), which marked the course of the river Karkara. Here we had hoped to see the *auly* of the Boginty, but could not find them, and hence turned to the north-north-east, so that the Karkara remained to the right of us, and by evening we came out to the river, which our guides called Chirik-su, and on which we spent the night. The valley of this river was treeless here, bounded by high mountains and aligned from south to north. The night was cold, and by the morning it was minus 2°C.

On 11 September we got under way from our camp at ten o'clock in the morning and, having forded onto the left bank of the river, we climbed a hill and made our way to the west-north-west across the steppe plateau. To the right of us the Chirik-su, from which our track was slowly diverging, could be seen continually. After three hours we again drew nearer the river, which we found here to be twice as wide. It was enlarged, and its direction was slightly changed into a latitudinal one, by the confluence from the left of the river Karkara, after the junction with which the united river takes the name Kegen-su. Visible beyond the river, a ridge stretched from the east-north-east to the west-south-west, drawing nearer the course of the Kegen on its right side.

After three hours of further travel to the west, the river Kegen was now flowing across the longitudinal (with respect to the direction of the range) valley of the Zailiiskii Alatau, which gradually turned into a gorge; because of its inaccessibility, we had to go round this gorge and come out to the river Kegen where its valley was getting wider again. The rock outcrops here consisted of red porphyry. After an hour and a half travelling along the valley we again came to its entry into a wild gorge, due to the absolute inaccessibility of which we had to leave the course of the river once and for all and to climb up the high Dzhalanash plateau, through which the river forces its way.

After a further hour we descended into the deep valley of the third Merke, which had blocked our route, and regained our old road. In the depths of the valley we had our afternoon snack in a grove on the river bank. Here the outcrops consisted of the same limestone which we had come upon at the Tabul'gasu, and which contained fossils characteristic of the Carboniferous system,

namely *Rhynchonella* and *Productus* with longitudinal furrows. The extent of this limestone was not clear either, because it appeared at the surface only in the form of flat rocks. Above it, as on all the Merkes and on the whole plateau surrounding it, there was piled up alluvium of poorly cemented sand with a multitude of huge and small boulders of porphyry, syenite, granite, diorite and conglomerates of these same rocks.

We reached the second Merke by the previous track, but having gone across its deep valley and come out again onto the plateau, we took to the right, that is more towards the north-west, and reached the first Merke at a much lower point than before, nearer to its confluence with the Kegen.

The descent towards the first Merke was very prolonged, because its valley was even deeper here. The rocks surrounding it here consisted of red porphyry. From the descent one could see the confluence of the Merke with the Kegen, which after having received all three Merkes, was making its way through a wild gorge; here its flow, like the Imatra,<sup>1</sup> took on the character of a sheer waterfall, owing to which the Kirgiz identified it by the name of Ak-togoi.

The place where we made a halt on the first Merke was covered with beautiful thickets of trees and bushes, whereas higher up, where we had crossed the valley of this Merke on our way to Issyk-kul', there had been no woodland vegetation. The thickets, in the middle of which we spent that night, consisted of willow (*Salix viminalis*), poplar (*Populus suaveolens*), *argai* (*Cotoneaster* sp. and *C. multiflora*), eglantine (*Rosa platyacantha*) and *cherganak* (*Berberis heteropoda*). The night was not cold.

On 12 September we left our beautiful camp-site early in the morning, by an extremely long and steep climb we got onto the Dzhalanash plateau and at first proceeded parallel to the Ak-togoi at a distance of almost fifteen *verst*s, then gradually moved away from it. To the left of us there remained a breach made by the river Chilik through the same plateau, to the right there was the Kegen, which had already broken free from the wild gorge (Ak-togoi), but was still flowing in a very deep valley. However, when we looked into this valley, we were delighted to see Kirgiz *auly* and made our way towards them in the hope of speeding up our return to Vernoe by changing a few of the utterly exhausted horses and especially our camel.

After about three hours of continuous descent and a dangerous crossing of the wide and rapid Kegen, which had by now assumed the name of Charyn and which here had the width of the Aare near Interlaken,<sup>2</sup> we eventually reached the

<sup>1</sup> The spectacular Imatra falls occur on Finland's largest river, the Vuoksa, where it is forced between high gneiss cliffs at a point where its course is only 50 metres wide. Backed by a massive lake system that covers some 64,000 square kilometres in south-central Finland, the volume of water passing over the falls reaches 120 million litres per second.

<sup>2</sup> The river Aare, flowing between the Brienersee and Thunersee at Interlaken, was evidently observed by Semenov during his visit to Switzerland in 1853.

*auly*. Several hours passed while we were having our first hearty dinner, consisting of a whole sheep, since our departure from Vernoe and while we were negotiating with the Kirgiz, who, for a moderate payment, at last supplied us with six horses and a camel, and we started on the journey at five o'clock in the afternoon, when the sun was already declining to the west. We climbed the heights which surrounded the valley for a whole hour and came onto the plateau. Across it we rode at a trot for the fifteen *versts* which separated us from a ridge, extending in front of us from west to east, and which the Kirgiz called Turaigyrtau. The sun had already set when we started climbing this ridge and we had to stop overnight half-way through the ascent at a stream, which was flowing from it.

On 13 September we got on our way very early in the morning. The route went steeply uphill through a wild transverse ravine between the black, bold and abrupt crags, which jutted out from all sides. The whole ridge consisted of diorite porphyry and, as it turned out from my measurement the following year (1857), rose to 2,000 metres above sea level. When we climbed to the top of the mountain pass, we again saw before us a high steppe valley, about fifteen *versts* wide, stretching from west to east. In vain our eyes sought out *auly*. To the left of us the gorge of the Chilik was visible and beyond it a junction, linking the first chain with the second. Beyond the descent I noticed a porphyry conglomerate, which constituted its margins, here and there revealing itself as if in strata, sharply inclined to the north (at 40°) and extending from west-north-west to east-north-east. I did not see any other rock here. The whole steppe valley was dusted with sand deposits together with a great multitude of boulders from the same mountains. It was pitted with marmot's burrows and was rich in salines. All the plants were, of course, scorched and dried out, only some *solianki* (*Salso-laceae*) were fresh. We descended to the steppe at the foot of the next ridge and here saw numerous herds and *auly*. Without wasting time, we made our way there and in about three hours we reached them. Here again a delay ensued until nightfall and the following day. The *aul* in which we stayed was situated at a small spring at the foot of a rounded, but elongated hill of red porphyry.

On 14 September at seven o'clock in the morning we left the *aul* and made our way to the west and north-west diagonally across the Seirektash mountains, then proceeded along the longitudinal valleys. These mountains were almost the same height as the Turaigyrtau ridge parallel to them. Their rocks were flatter and more rounded, and all of them consisted of red porphyry, and not diorite. In one place I came across an exposure of a large vein of quartz; all the rest comprised quartz-containing porphyry. When we started coming down from the mountains, we saw in the north-west the course of the Chilik, marked by a belt of trees; but in the gorges of the mountains on the northern side there were apple-trees growing. In the north there was again visible a wide steppe valley on a plateau, about twenty-five to thirty *versts* wide, and beyond it there was another

parallel ridge, Boguty. However, this ridge, which was almost as high as the previous one, did not cross the Chilik and did not extend further to the west, whereas the two previous ones were joined to the high crest of the Zailiiskii Alatau by a special nexus beyond the Chilik.

Descending from the mountains, we came out to the valley of the Chilik, and travelling for about fifteen *versts*, made a halt on its bank, having forded all its wide and rapid arms with difficulty. The Chilik here flows towards the west and north-west, carving out a very wide and deep hollow for itself in the steppe. The slopes of this hollow are very steep and consist of sandy alluvium, filled with boulders of porphyry, diorite, syenite, granite and conglomerate. Among the trees, willow, poplar, hawthorn (*Crataegus pinnatifida*), sea buckthorn (*Hippophae rhamnoides*) and eglantine (*Rosa geblariana*) predominated.

Beyond the Chilik we proceeded parallel to the northern chain of the Zailiiskii Alatau straight to the west and in about an hour and a half we saw the first *aul* by a small spring flowing from the mountains. Here we changed our horses and the same evening continued on our way. Having travelled for another hour and a half, we arrived at a new *aul* and here we stopped for the night.

On 15 September we set out from our camp at the second spring from the Chilik at seven o'clock in the morning, after two hours we crossed the river Karaturun and in another hour we came to Dzhainak's *aul*. Here we stayed for an hour and a half, and at half past eleven we continued on our journey. At about three o'clock in the afternoon we crossed the Turgen near a row of 'chudskii' tumuli, and at sunset reached the river Issyk, where we spent the night about four *versts* below our previous camp-site.

On 16 September at ten o'clock in the morning I returned safely to Vernoe. Khomentovskii rejoiced at my safe return, the more so as while I was absent there had occurred events, in which I might have been useful to him. His relations with the neighbouring Karakirgiz tribe of Sarybagish to the south-west continued to be strained, and more than once the latter, although without their former impudence, had continued their rapacious forays into the new Russian Trans-Ili territory, which was not yet sufficiently firmly established. In particular, Khomentovskii was beside himself at the pillage, ten *versts* away from Vernoe, of a Russian merchant caravan on its way to Tashkent and also at Karakirgiz raids, directed at our loyal subjects, the Kirgiz of the Great Horde. The courageous Khomentovskii quickly resolved to undertake a campaign against the Sarybagish *aul*, which lay in large numbers to the west of Issyk-kul', on to the upper reaches of the river Chu, with the purpose of dispossessing them, that is taking away from them their herds of horses and livestock, in order to replace the losses inflicted by their forays on Russian subjects.

Khomentovskii's strong detachment, which had left Vernoe soon after the beginning of my journey to Issyk-kul', consisted of three hundred Cossacks, one

company of infantry mounted on horses, two mountain cannons, a few rocket mountings and a great number of Kirgiz of the Great Horde.

The detachment had safely crossed a high mountain pass and came down to the valley of the river Chu, below the Kokand fortification of Tokmak.<sup>1</sup> Here it found innumerable masses of Karakirgiz nomads, devastated their *auly* and, having taken possession of their nearest herds, started on the way back. But the Karakirgiz, who had taken flight at first, gathered in countless numbers and began to pursue our detachments, which became seriously extended on their difficult ascent to the pass, threw themselves into the attack with exceptional bravery, in spite of the fact that the rocket mountings, which they had never seen before, and also the shots of our Cossacks, were producing great devastation among the Sarybagish. The losses of the detachment, however, amounted to seventeen people killed or seriously wounded. When the wounded, transported with difficulty on horses, made stops and fell into Karakirgiz hands, the ferocity of the latter was so great that they hacked them to pieces. Nevertheless, the impression made by Khomentovskii's campaign was very strong, as the number of those killed and wounded on the Sarybagish side was great. Khomentovskii considered it particularly important to assess this impression, and hence decided to organize a new reconnaissance detachment for this purpose without delay.

He offered to place this detachment, consisting of almost a hundred Cossacks and a few Kirgiz guides, at my disposal in order to reach the river Chu, and if I did not find the Sarybagish there, to penetrate to the western limits of Issyk-kul' and to return to Vernoe via the mountain passes of the Zailiiskii Alatau which were familiar to me.

We left Vernoe, ninety people in number, on 21 September at eleven o'clock in the morning. We travelled towards the west that day, along the foot of the northern chain of the Zailiiskii Alatau for about twenty-seven *versts*, to the river Kesken, an important tributary of the river Ili, which emerges from the snowy mountains. The weather was dull and turned to rain.

After travelling for about forty *versts* along the foothills of the Zailiiskii Alatau towards the west from Vernoe and descending into a deep hollow which intersected our path, we heard desperate screams. Karakirgiz bandits were pillaging a small Uzbek caravan, which was going to Vernoe. When we galloped up to the aid of the caravan, the Sarybagish had fled before they had time to plunder the caravan: we caught them at the moment when they were taking off the Uzbeks' boots in order to take away their money, which they kept in their boots. Without wasting time talking to the Uzbeks, together with some of my Cossacks I rushed

<sup>1</sup> Tokmak, a small *uezd* town, 20 km from the left bank of the river Chu in Semirech'e, was founded in 1878. In 1893 it had 4,857 inhabitants of very mixed ethnic origin (Sarts, Tatars, Dungsans), but with a clear Muslim majority. The surrounding district had a population of 99,553, 84% of whom were Kirgiz, mostly nomadic breeders of horses, cattle and sheep. A small minority (7,396) were peasants, practising irrigated agriculture in the Chu valley.

to pursue the raiding party. This pursuit went on for a couple of hours and ended when the bandits, who had abandoned their outer clothing, nevertheless managed to gallop away from us. By the end of the chase only three bandits, lagging behind, remained ahead of us, but on our part too the majority of those pursuing had fallen behind, owing to the horses' tiredness, and there was left by my side only my Cossack-interpreter, as we had the best horses. We, too, like the pursued Karakirgiz, were going at a slow pace, two hundred metres apart from each other. I did not want to shoot at unarmed people, and hence decided to go back to the place which I had fixed as our bivouac, which was all the more necessary as those being pursued set fire to the dry steppe in the direction of the wind, which was blowing in our faces. We avoided an encounter with the fire wall, by going down into a deep hollow which we came upon, and then settled in it overnight.

On 22 September the weather cleared a little: the fog dispersed and even the mountains with their snowy summits appeared. Having travelled for about thirty *versts* towards the south-east to the river Chemolgan, we were forced to make a prolonged stop here while waiting for fresh Kirgiz horses, as the Cossack ones on which we had left Vernoe turned out to be unsuitable for our long and difficult journey. By evening the weather deteriorated again, and it went on raining until far into the night.

On 23 September we left the Chemolgan early in the morning on fresh Kirgiz horses amidst impenetrable fog. Our journey was hampered by the fact that we had to cross a dense network of deep hollows with steep sides, which intersected the foothills. After four hours we reached the river Uzun-agach, by which we made our afternoon halt. Although the autumn vegetation of the steppe had already withered somewhat, it had not completely dried up; what especially caught the eye were the pink flowers of tall hollyhocks (*Althaea officinalis* and *Lavatera thuringiaca*), light blue flowers of chicory (*Cichorium intybus*), pale yellow flowers of *sofor* (*Sophora alopecuroides*) and dark blue flowers of steppe sage (*Salvia silvestris*). Liquorice (*Glycyrrhiza aspera*), which is very widely distributed here, was still in bloom.

During our halt the weather completely cleared up: at two o'clock in the afternoon it was 18°C. We moved on and after about twenty *versts* reached the river Kara-kastek. Here, with clear weather, there was a magnificent picture of the sunset in store for us. To the left of us, sharply outlined against dark azure, there towered the majestic range of the Zailiiskii Alatau, at the western edges of which stood out the high rounded summit of Suok-tiube: snow-white strips, illuminated by the pink light, were shining in the sunset. But in the far west, when the purple sunset, above which two or three small golden clouds still hung for awhile in the air, had completely gone, high above the mountains to the left the pale golden crescent of the new moon was revealed. The night which fell was very cool, but we still travelled for another three hours by the weak moonlight to our camp on the Kastek at the foot of Suok-tiube.

At seven o'clock in the morning on 24 September it was 7°C, and the weather was absolutely clear. Proceeding along the Kastek valley from north to south, we started climbing the Zailiiskii Alatau. We continued up the Kastek for about four hours between granite rocks. Eventually, the Kastek divided into two branches, of which one was going from the south-east, and the other from the south-west. We went along the first one in order to cross a high mountain pass to come out at the river Chu a little lower and further from the Kokand fortress of Tokmak. Going up along this branch, we finally reached the top of the pass. From this summit, on which the cold temperature justified its name of Suok-tiube ('Cool mountain'), we saw the entire valley of the river Chu, which here formed several branches, shining in the sun. To the left, one could also see the course of the river Kebin, which emerges from a longitudinal valley of the Zailiiskii Alatau, separating its northern and southern chains and discharging into the river Chu on its exit from this valley.

Beyond the river Chu there stretched a high mountain ridge, the summits of which were covered with snow. We came down from the mountain pass in no more than an hour and, coming out to a stream abundant in water, which discharges into the river Chu and is called Beisenyn-bulak, we stopped for the night.

When we awoke the next day (25 September) the temperature was minus 1.5°C. The night was very cold, and my tent became covered with ice. The morning was foggy; nevertheless, we got under way from our bivouac at seven o'clock in the morning. Of course, there was no time to be lost. It turned out that there were no Sarybagish in the Chu valley by then. It was obvious that, frightened by their bloody battle with the Russians, they had fled, in all likelihood to Lake Issyk-kul', and that is where I decided to confront them with my whole detachment, proceeding up the river Chu through the wild Buam gorge. In essence, the march of eighty *verst*s through an almost impassable gorge, in, or beyond, which we were bound to encounter embittered enemies, since all the Cossacks of my detachment had already participated in the Khomentovskii campaign, might seem to be an act of madness for my quite numerous detachment, consisting of ninety horsemen and twenty pack-horses (fortunately, we did not have the camel), and it was not easy to maintain spirits and self-confidence among the Cossacks.

The thick fog was very favourable to us: if any mounted patrols were undertaken from Tokmak, we could cross the Chu valley unnoticed and come into the narrow gorge during the day. And that is how it was done. Snowflakes were falling while we were descending to the Chu valley, but towards the end it had already turned to rain, and after our descent into the valley it stopped completely.

The river Chu, where we came out to it, was flowing across an extensive valley which was six *verst*s wide, and its course was accompanied by woodland vegetation, which consisted of tall poplars (*Populus euphratica*).



We crossed the wide valley, which stretched diagonally from east to west, in a south-south-east direction, and, unnoticed by anyone, entered the Buam gorge, out of which the river breaks into its wide valley near the porphyry Boroldai knoll. When we came into the gorge, it soon became so narrow that it was impossible to proceed any further along the right bank of the Chu, on which we were, because rocky cliffs of enormous height fell down to the river extremely steeply. We all had to ford the rapid course of the river to its left bank, along which we continued our journey, but then a similar obstacle forced us to cross again to the right bank.

The day was already declining, the sky had become covered with dark clouds, and soon a dark night fell. Only from time to time the full moon, throwing some light upon our way, appeared between the clouds. Our progress was impeded in the extreme by the fact that our path could not run uninterruptedly along the river bank itself, as here and there waterside cliffs fell absolutely vertically down to it, and it was necessary to climb up the side walls of this rocky corridor, known by the name of Buam (Bom, to the Altai people), along dangerous paths, which went round the sheer precipices from above. Of course, we had to make these detours on foot, leading our horses by their reins, unloading the pack animals and carrying their loads in our arms. In some places, instead of making these diversions we went, where it was possible, along a ford at the foot of the cliff, against the rapid current of the river over the rocks, which fill its bed, with an incessant danger for each one of us of being swept away by its furious waves.

Thus we proceeded with incredible difficulty until three o'clock in the morning and at last reached a narrow hollow, in which we decided to stay until dawn. This place was on the very bank of the river between two high 'boms', at the tops of which I placed guard pickets on both sides. This precaution was necessary because if the Karakirgiz, getting over the summits of the mountain cliffs, had noticed our bivouac at the bottom of the gorge, they could have wiped out our entire detachment, by showering it from above with huge stones and rocks, which were overhanging it and could easily be pushed down. The Cossack sentries were to raise the alarm, warning us with rifle shots, in case of imminent danger. I tried in vain to fall asleep in the tent to the noise of the waterfalls formed by the river Chu. The night I spent in the Buam gorge was nearly the most anxious in my life. On me rested the responsibility for the lives of almost a hundred people and for the success of the whole enterprise.

My nervous state soon proved to be justified: two warning shots resounded one after another. The Cossacks immediately rushed to their saddled horses, and, grabbing my pistol, I jumped out of my tent and rushed up a steep path on the nearer 'bom' towards the Cossack sentry, in order to find out the reason for the alarm. It turned out that the Cossacks had heard a continuous fall of small stones above them. Since the moon lit up the mountain slopes with full brightness, the Cossack had noticed that high above him along the mountain slope two

Kirgiz were picking their way with difficulty, leading their horses by the rein, and under the horses' hooves small stones were slipping down into our gorge, making a slight noise. I stood for a long time with the Cossack, having a good look at the Karakirgiz movements through binoculars, and finally became convinced that they did not have any hostile intentions towards us, but on the contrary, having noticed a large Russian detachment encamped overnight, were going round it in fright, in peril of their lives, over steep inaccessible slopes, proceeding along the Buam gorge in the direction of Lake Issyk-kul'. The only danger we could expect from them was lest they should warn the Karakirgiz who were at Issyk-kul', about the approach of the Russian detachment, and thereby might prepare a hostile reception for us. That is why, after returning to my tent towards dawn, I roused the whole detachment, and we started on our journey again on 26 September no later than five o'clock in the morning.

For about two hours our journey was still as difficult as the day before; but then the walls of the gorge began to diverge, and it turned into a valley with gentler slopes. Very soon after entering this valley we came across a small Karakirgiz *aul*, which consisted of five *iurty*. The men galloped away on their horses as soon as they noticed us, and only an old man, who did not have a horse, rode off on an ox and hid in a small mountain ravine. In the *iurty* there remained only women and children, who had nowhere to go; despairingly and with a deathly pallor in their faces, they threw themselves towards us, pleading for mercy. I hastened to reassure them, gave them small presents and explained to them through an interpreter that we did not have any hostile intentions, but were going to visit their chief *manap* Umbet-Ala, with whom I wanted to be *tamyr* (a friend). We learned from these women that Umbet-Ala with his whole clan was to be found near the territorial limit of Kutemaldy on the shore of Issyk-kul'. We hurried there with the greatest possible speed and soon found ourselves amidst an incalculable mass of Karakirgiz herds and flocks. Four Cossacks had to be sent forward in order to clear a way for our detachment through this mass of animals. I ordered this Cossack advance party to repeat, when meeting the Karakirgiz, what had been said to the women in the first *aul* we encountered, that is, that we were coming without any hostile intentions, directly to visit Umbet-Ala.

The territorial boundary of Kutemaldy lay at a bend of the river Chu, which, after emerging from a gorge in the Tian'-Shan' with the name of Kochkara to the plain, which forms part of the Issyk-kul' basin, but, fifteen *versts* short of the lake, turns to the left and bursts through the Buam gorge. At this bend the Kutemaldy stream, fed by marshes, discharges into the river Chu.

The entire flat area between the bend of the Chu and the shore of Issyk-kul' was occupied by an incalculable multitude of Karakirgiz *iurty*. Obviously, almost the entire tribe of Sarybagish had encamped here near the *aul* of Umbet-Ala. At last, we reached his *aul*. Here an excellent *iurta*, hurriedly prepared for those who declared themselves to be the guests of Umbet-Ala, awaited us. In the *iurta*

rich carpets were spread out, and when I took a seat on them, the *manap*'s brother and uncle, with some other privileged persons, came into the *iurta* and announced that Umbet-Ala himself was not at home, as apparently he had gone thirty *versts* away into the valley of the river Kochkara to prepare a *baiga*, that is a funeral feast for the Sarybagish who had been killed. I had to explain the purpose of our arrival to the family of the *manap* and the Sarybagish elders.

I told them that I had come from afar, from the capital of Russia to see how the Russian settlers lived at a remote border; only here did I learn of the armed conflict which had taken place, and in my opinion, good neighbourly relations should be established between the Russians, who had built a town on the land of the Great Horde, subject to Russia, and the Karakirgiz; and that neighbours should not carry on *baranty*, which could so easily turn into a war (*dzhou*); that the Russians had never been, and never would be, the first to attack the Karakirgiz, but if on the part of the latter any kind of *baranta* were to be carried out, not only against the Russians themselves, but also against their subjects, the Kirgiz of the Great Horde, retribution would be immediate, as had happened; but that the Russians did not wish to continue any hostilities, unless the Karakirgiz themselves would give cause for this by a new *baranta* or robbery of merchant caravans. That is why I had come to see Umbet-Ala, to try to become his *tamyr*, and I asked them to pass on to him my presents, for which Umbet's family gave me in return three excellent horses. Thus, according to Karakirgiz custom, Umbet-Ala had become my *tamyr*.

The day passed in talks and entertainments and my inspection of the western extremity of the lake. Umbet-Ala's relatives invited me to the forthcoming *baiga*, but I declined, considering it on the one hand impossible for me to be present at the funeral feast for those killed in a battle with the Russians, and on the other hand, fearing some kind of conflict between the Cossacks and Karakirgiz. I put forward as the reason for my refusal that larger Russian detachments, which (as I asserted) were stationed by the mountain passes, expecting us, might be alarmed by the duration of our absence, and, coming in search of us, could come into some kind of conflict with the Karakirgiz if they encountered them. During the night we took all possible precautions: all our horses were saddled and did not leave the hands of the Cossacks, who slept in turn; sentries were posted around the *iurta* erected for me. Although I was convinced that the Karakirgiz would treat irreproachably the custom of hospitality, which is sacred in their eyes, nevertheless these precautions were not superfluous, especially as they reassured the Cossacks, who so recently had witnessed the brutal vindictiveness of the Karakirgiz against our wounded. The next day, 27 September, I got up at five o'clock in the morning and left the *aul* of Umbet-Ala, accompanied by my interpreter, another Cossack and two Sarybagish guides. I wanted to achieve one of the main objectives of my visit to the western extremity of Issyk-kul', namely clarification of the hydrographical relations between this lake, the river Chu and

the river Kutemaldy, about which Humboldt had already known from information collected by him in 1829 from Bukharan and Tashkent merchants in Semipalatinsk. During my stay in Berlin (1853) geographers thought that Lake Issyk-kul' had an outlet, but some believed the river Chu to be this outlet, while others, on the basis of information circulated by Humboldt, thought it to be the river Kutemaldy, which supposedly issued from Lake Issyk-kul' and flowed far into the steppe.

On the excellent horses presented to me by Umbet-Ala's family, in three-quarters of an hour we came from his *aul* to the place where the river Chu, flowing across the Issyk-kul' plateau from south to north, sharply changes its direction to the west and breaks into the Buam gorge.

The question I was keenly interested in was soon clarified. The main constituent branch of the mighty river Chu originates under the name of Kochkara in the Tian'-Shan', comes out of its transverse valley onto the Issyk-kul' plateau, but not following its natural slope towards the lake, it turns straight to the west into the Buam gorge. To the east of this bend I saw a marshy area, from which along its natural slope into Issyk-kul' there flowed the little river Kutemaldy, which was no more than six *versts* long. The Sarybagish who were escorting me explained the name of the river to me by the fact that it was so shallow that if someone took it into his head to sit down in the middle of it, he would only wet his backside (Kutemaldy means a wet backside). However, the Karakirgiz told me that during flood-time water often flowed from the river Chu via the little river into Issyk-kul'. But when I first saw the Kutemaldy, it did not come immediately from the Chu and was no more than twelve metres wide, and its current was quite gentle, as its fall over a distance of five *versts* hardly exceeded twelve metres. I rode as far as the river's mouth, and having turned along the lake shore, returned to Umbet-Ala's *aul*, completely convinced that Lake Issyk-kul' did not have an outlet, that it did not feed the river Chu at present, and that this mighty river was formed from two main branches: the Kochkara, originating in the perpetual snows of the Tian'-Shan', and the Kebin, flowing from the perpetual snows and the transverse valley of the Zailiiskii Alatau. It goes without saying that if one were to imagine the lake's level rising by only fifteen to twenty metres, the river Chu would have become the outlet of Issyk-Kul'; but I put off any thoughts as to whether it had ever been so until my excursion to the lake basin the following year (1857). My main purpose had been achieved, and the safety of the people with whom I was entrusted demanded my immediate return to Vernoe, contenting myself with the preliminary results which I had obtained.

Having returned to Umbet-Ala's *aul*, I raised my whole detachment and, taking final leave of my hospitable *tamyr* (friends) on amicable terms, left for my return journey 'to Russia', as the Cossacks put it, after hearty mid-day Karakirgiz hospitality. We travelled for fifteen *versts* along the northern shore of Issyk-kul'

(Kungei) and then started going diagonally up to the east-north-east for the difficult ascent of the southern chain of the Zailiiskii Alatau. Here again, as at the eastern extremity of the lake, I took delight in admiring the wonderful beauty of the high range rising beyond the lake.

Our first stopping place, for the night of 27–8 September, was still on the southern slope of the southern chain of the Zailiiskii Alatau, and here as a precaution we did not light any fires, as we could not consider this place to be safe. After the hospitality we had been shown at their home, the Karakirgiz might nevertheless consider it permissible to make some sort of attack on us outside their boundary, and that was what the Cossacks were afraid of, although I was convinced of our immunity in the eyes of the Karakirgiz.

On 28 September we moved off very early from the site of our dangerous overnight stop and quickly started ascending the steep slope. On the way we met a huge wild boar, which we managed to kill. A few hours after that we reached the high Diurenyn' pass, which according to my hypsometric measurement turned out to be 3,000 metres in altitude and was already completely covered with snow at this time of year. The descent from the pass to the longitudinal valley of the Kebin, which separated the two chains, was accomplished very quickly, and before sunset we had already reached the forest zone, which consisted of magnificent, tall spruce-trees (*Picea schrenkiana*). The Cossacks, who had begun to feel out of harm's way, were delighted, set up my tent near a waterfall, built splendid fires, not of *tezek* (dung), as is usually done in steppe zones, but of dry wood boughs, and prepared an excellent supper from the huge wild boar which we had killed on the journey. Already that evening, unbeknown to me, they sent two Cossacks to Vernoe on the best horses, with spare ones, to get vodka, and by morning the vodka had arrived, in spite of the fact that the distance to Vernoe over the second snow pass was no less than ninety *versts*.

On the morning of 29 September, we descended unhurriedly to the valley of the Kebin and made a halt by the river itself, where we found traces of a Kirgiz raiding party. It was amusing to watch one of our guides, a Kirgiz of the Great Horde. He was picking up bits of dung and putting them to his nose, and then suddenly, turning pale, announced that the bandit gang had moved from this place no more than two hours ago, that it consisted of Karakirgiz of the tribe most hostile to us, who had left their bivouac when they noticed us coming down from the mountains, that the gang was somewhere in the gorge not far away and, moreover, that it was numerous. It goes without saying that the Cossacks did not share the Kirgiz's fear. In Vernoe it was already known where we were, and to defend ourselves from an attack by the Kirgiz in such a fine wide valley would not be difficult, and the attack itself seemed to us to be absolutely inconceivable.

That day we crossed the high Keskelen pass in the northern chain of the Zailiiskii Alatau; it, too, was no less than 3,000 metres high and was heavily covered with snow on its northern side. On coming down from this pass we had to slide

down on the snow with our horses in a funny, but quite safe, way. We spent the night of 29–30 September still very high up on the river Keskelen, and on 30 September, having come down along the river's valley to the foothills, settled for our last night about thirty *versts* from Vernoe.

On 1 October we rapidly covered our final stage and returned safely to Vernoe, where we were ceremoniously met by the town's population. Colonel Khomentovskii and artillery Captain Obukh, two intellectuals of this young colony, which promised a brilliant future, rejoiced especially at our success. Captain Obukh was a very likeable and talented man, but unfortunately no stranger to the common vice of the best people of our young colony, alcoholism. Later, together with the famous traveller N. A. Severtsov,<sup>1</sup> he was the first to enter the rampart of the fortress during the capture of Tashkent,<sup>2</sup> but was struck down by an enemy bullet.

The late autumn of 1856 was setting in. To undertake further journeys this year to the interior of the Tian'-Shan' was impossible by now, and I had to postpone them until the beginning of the summer of the following year. But my first objective had been achieved: I had seen the Tian'-Shan' in the full glory of its outer appearance, for a distance of almost 200 *versts*, along the entire basin of Issyk-kul', the shores of which I had reached at both of its extremities, the eastern and the western. That is why I decided to leave Vernoe at the beginning of October and to undertake two more autumn excursions: one to the area of Katu, on the Ili plain to the south of the Semirechensk Alatau, beyond the Altyn-emel' Pass; the other in the same direction, within China, to the town of Kul'dzha.

The first excursion could not involve any obstacles, but the latter one was extremely difficult, because the Chinese authorities did not let any Russian subjects across the border, except for Russian Cossack mail, which went three times a year from Kopal to Kul'dzha, to the Russian Consul, who had his permanent residence there. I was attracted to the area of Katu by rumours of some kind of volcanic phenomena, which were supposed to be taking place there, according to Chinese information.

From Vernoe I safely reached the Altyn-emel' picket along the Kopal road in my *tarantas*, and from there with two Cossacks travelled across the Altyn-emel'

<sup>1</sup> Nikolai Alekseevich Severtsov (1827–85), zoologist, zoo-geographer and explorer, was a pupil of K. F. Rul'e. He graduated from Moscow University in 1846 and in 1855 defended his dissertation on *Periodicheskie iavleniia v zhizni zveri, ptits i gad Voronezhskoi gubernii*, a study of territorial complexes which was the first Russian essay in ecology. From 1857 he made numerous travels in Central Asia, publishing extensively on the geology, fauna, and geography of those regions. In particular he mapped the geology of the central Tian'-Shan', the relief of the Pamir and bird migrations. On the basis of a collection of 12,000 species, he made systematic studies of birds in Russia and Turkestan, and in 1873 published *Vertikal'noe i gorizonttal'noe raspredelenie v turkestan'skikh oblastiakh zhivotnykh* and also *Puteshestviia po Turkestan'skomu kraiu i issledovanie gornoj strany Tian'-shan'ia*. His *Orograficheskaia ocherk Pamir'skoi gornoj sistemy* was published posthumously (1886).

<sup>2</sup> After an initial unsuccessful attack in late September 1864, Russian forces under General Cherniaev captured Tashkent on 14–17 June 1865. Pierce, *Russian Central Asia*, pp. 18–23.

Pass into the area of Katu in which I was interested. Here in the low mountains, which were smoking slightly, I indeed found deposits of sal-ammoniac and sulphur, but all these phenomena turned out to be produced by the burning of rich subterranean beds of coal, and therefore, the phenomenon was not volcanic, but only pseudo-volcanic.

Having inspected the interesting Katu area, I returned to the Altyn-emel' picket, and from there I travelled in my *tarantas* along the highway to Kopal, where I arrived on 17 October, in the hope of undertaking, with Colonel Abakumov's help, a trip to Kul'dzha with the autumn mail, which was going to the Russian Consul Zakharov. Unfortunately, this mail had already left Kopal two days before my arrival, but the daring Abakumov suggested that, taking two Cossacks, I should cross the Semirechensk Alatau by the shortest route and try to catch up with the mail, which was travelling fairly slowly by a roundabout way through Altyn-emel' and the Borokhudzhir frontier.

There was no time to lose, and I set out the same day with two Cossacks on my risky journey. Abakumov gave me an excellent horse, which was saddled with my officer's saddle, and provided me with complete weaponry and a Cossack's costume, which I put on. One of the Cossacks escorting me knew the Kirgiz and Kalmyk languages well and could serve me as a reliable interpreter. At the same time Abakumov supplied me with instructions for the Cossack *sotnik* (lieutenant), who had been sent to Kul'dzha with the mail, and who was instructed to place himself at my disposal at once.

Along paths familiar to my fellow-travellers, on that same day (17 October) we crossed a pass in the Semirechensk Alatau, partly covered with snow, had our afternoon snack by the river Tiul'ku-bulak, the course of which was accompanied by beautiful trees, bird-cherry and willow, and we spent the night on the Alaman-su after an immense, non-stop journey of eighty *versts*.

On 18 October, having left our overnight camp, I encountered a great disappointment: we did not meet our mail anywhere, but the worst of it was that during the whole day we did not find any Kirgiz *auly*, which we needed badly, as we had no food supplies with us, except for a small quantity of dry bread. The Kirgiz had moved on from the foothills on account of the onset of cold weather. All evening we were climbing hills, trying to discover the presence of a Kirgiz *iurta* anywhere at all, but to no avail. We had to spend a cold night of 18-19 October in the open air, without any food and with only meagre fodder for the horses. Next day, 19 October, we wandered hungry again and only towards the evening, on climbing a hill, to our general relief, saw several Kirgiz *iurty* in a small hollow. In one of these *iurty* we found food and shelter after our enforced two-day fast.

The following day, 20 October, at dawn we made our way by the most direct route towards the Chinese picket of Borokhudzhir, and to our indescribable joy, there we saw our mail just coming in; it consisted of a *sotnik* and eight Cossacks.

I passed Colonel Abakumov's instructions to the officer and joined the detachment in the guise of an escorting Cossack with my two other Cossacks. From Borokhudzhir<sup>1</sup> our route lay straight to the east through Kul'dzha province between the Iren-Khabirgan Range, linked to the Semirechensk Alatau, and along the river Ili through the ancient town of Horgos.<sup>2</sup>

Our Cossack mail detachment, consisting of twelve people after I had joined it, continued on its way escorted by a Chinese detachment, which consisted of twenty horsemen, armed with bows and arrows, and an officer. We spent the nights at Chinese pickets, which, as opposed to the Russian ones, were surrounded by trees. At night we were accommodated in the courtyards of the pickets on strips of felt, which we spread out, and which were turned up so as to cover all of us, lying close by one another, as the nights were very cold. Of course, the officer and I occupied the middle place. The observant Chinese noticed some of my peculiarities by comparison with the other Cossacks, namely, my fine linen, gloves and an officer's saddle rather than a Cossack's one. To questions about me from the leader of the Chinese detachment, the Cossacks replied that I was a demoted mandarin, a relative of their officer. The leader of the Chinese detachment suggested that I should leave the mail convoy and not continue by the slow route, but accompany him on a detour of about forty *versts* to the north-east towards the Talkinsk Pass, and visit his home there, where he wanted to show me to his family. I gladly agreed to this suggestion and went with him, accompanied only by an interpreter from the Cossacks.

Towards evening we were struck by an unusual sight: in the sky there appeared a meteor of blinding brightness, which noisily broke up into several fiery pieces, which fell, according to all our calculations, on the northern slope of the Talkinsk Pass. The house of the Chinese officer was much nearer than the place where these aeroliths fell.

We were greeted by the officer's wife and children with cordial curiosity. The interior of the dwelling consisted of a very spacious and bright room, as the frames of the huge windows with beautiful casements were covered with thin Chinese paper, which let the light through well. A huge stove with stove-couches (*kan*) occupied part of the room; in the same place a large cauldron had been set up, in which brick tea was made with milk being added to it. It was to this tea that I was treated by our hospitable hosts. The Chinese ladies paid special attention to my black gloves, assuming that it was the colour of the skin on my hands, and were extremely surprised when I took off these gloves. We found them dressed only in long shirts, like ladies' night-dresses, but later on they dressed themselves up in silk *kurmy*. However, we could not stay long at the house of our

<sup>1</sup> Borokhudzhir is now a small town on the river Ili some 90 km from the present Chinese border which runs along the river Horgos.

<sup>2</sup> Horgos (Ho-er-kuo-su/Hocheng), a Chinese border town on the ancient northern route from Gansu through Urumchi into the upper Ili basin. Shabad, *China's Changing Map*, p. 256.



hospitable hosts because we had to catch up with the mail before it arrived in Kul'dzha.

Consul Zakharov, of course, was not expecting my arrival and was astonished, when, having reported to him in Cossack uniform, I revealed my identity. Rumours about my journey to Issyk-kul' had already reached him through the Chinese, who, having learnt from the Kirgiz of the Great Horde about my visit to Lake Issyk-kul', did not suspect that the very same traveller, about whom they had told Zakharov, would appear in Kul'dzha in the guise of a Cossack. Zakharov expressed pleasure at being able to welcome me, especially as he had never been visited in Kul'dzha by an educated Russian. He appeared glad to show me his beautiful and excellently built stone house and his garden, which went down to the river Ili, and which was kept in good order by a Chinese gardener. He also showed me a map, translated from the Chinese, of Chinese Dzhungaria and the 'Tian'-Shan', prepared by him with the help of Siberian topographers, who had inserted on it the results of all the Russian surveys in the Balkhash basin up to that date.

I stayed for about a week in Kul'dzha at the home of our hospitable consul and thoroughly acquainted myself with the Chinese town, its shops, markets and temples.<sup>1</sup> I left Kul'dzha with the return mail on 27 October and crossed the border again at Borokhudzhir on 29 October. The weather was so cold that at the place where we spent the night on 30 October we woke up under our felt strip absolutely covered with deep snow. From the border to Kopal we travelled as quickly as possible, taking a shorter route through the Alaman Pass, which we already knew.

In Kopal I spent only one day and then took my final leave of my dear friend Abakumov, to whom I was obliged for my interesting visit to Kul'dzha, and, after three days non-stop travel along the post road, I returned to Semipalatinsk, where I stayed, as before, at the house of the kind Demchinskii, and this time, spending five days at his home, I had the joy of passing whole days with F. M. Dostoevskii.

Only then did all his moral and financial circumstances become clear to me. In spite of the relative freedom, which he had already been enjoying, his situation would nevertheless have been joyless, but for a bright ray, which fate had

<sup>1</sup> Situated in the Ili valley, one of the best cultivated and most densely populated areas of Xinjiang province, north-western China, on the border of the Kazakh republic, Kul'dzha emerged around the seventeenth century Tszin-din-si Lamaist monastery, but was officially founded in 1762. Later it developed a commercial function as the terminus of the Gansu-Xinjiang highway on the navigable Ili river. When it was occupied by the Russians in 1871, its population was barely 7,000; twenty years later it was 10,000, consisting of Taranchis, Chinese, Manchurians, Kirgiz, Kara-Kalmyks and Dungs. With the adoption of Islam it became an essentially Turkestanian town, rather than a Chinese one. For example, Grum-Grzhimailo reported in the 1890s that there was little evidence of Chinese architecture, although he added that many of its houses, including former Russian ones, had deteriorated into hovels.

sent him in the form of his personal relationship with Mar'ia Dmitrievna Isaeva,<sup>1</sup> in whose house and company he found a daily refuge and the warmest concern for himself.

Still a young woman (she was not yet thirty years old), Isaeva was the wife of a quite educated man, who had a good official position in Semipalatinsk, and who soon after Dostoevskii's settlement there became friendly with him and received him hospitably in his house. Isaev's young wife, whom he had married while still serving in Astrakhan, was a native of Astrakhan, who had successfully completed her course of study at the Astrakhan girls' high school, as a result of which she was the most educated and intelligent of the ladies of Semipalatinsk society. But irrespective of how F. M. Dostoevskii spoke of her, she was 'a good person' in the highest meaning of this phrase. They very soon got on well together. She was unhappy in her marriage. Her husband was not a bad man, but he was an incorrigible alcoholic, with the crudest instincts and manifestations when he was not answerable for his actions. She failed to improve his moral state, and only the care for her child, whom she had to protect daily from its father's irresponsible actions, sustained her. And suddenly on her horizon there appeared a man with such lofty spiritual qualities and such delicate feelings as F. M. Dostoevskii. Naturally, they speedily understood each other and became mutually attracted; one can understand what warm interest she took in him and what delight, what new life, what spiritual uplift she found in her daily conversations with him, and what a resource she, in her turn, was for him during his joyless stay in Semipalatinsk, a town which offered no intellectual interests.

During my first passage through Semipalatinsk in August 1856 Isaeva was no longer there, and I became acquainted with her only from Dostoevskii's stories. She had moved to a new place of residence in Kuznetsk (Tomsk province), where her husband had been transferred due to his unfitness to fulfil his official duties in Semipalatinsk. A lively correspondence, which sustained the spirits of both, sprang up between her and Dostoevskii. But by the time of my journey through Semipalatinsk in the autumn the circumstances and relationships of both had greatly changed. Isaeva had become a widow, and, although she was unable to return to Semipalatinsk, Dostoevskii had conceived the intention of marrying her. The main obstacle to that was their total lack of material provision, which bordered on poverty. Dostoevskii, of course, had his literary works in front of him, but he was far from believing absolutely in the strength of his

<sup>1</sup> Aleksander Isaev moved to Kuznetsk with his wife and son in May 1855 and it appears that Dostoevskii and Mar'ia corresponded on a weekly basis. According to Baron A. E. Wrangel, upon whose reminiscences Frank's account is heavily based, Isaev died in August 1855, leaving his widow in deep poverty. Eventually Dostoevskii was promoted, first to the rank of *unter-ofitser*, then to commissioned officer in October, 1856. Kjetsaa, *Dostoyevsky*, pp. 120-21; Frank, *Years of Ordeal*, pp. 200-11. Dostoevskii's emotional torment at this time is chronicled in *The Insulted and Humiliated*. Mar'ia finally consented to marriage in December 1856 and the ceremony was performed in Kuznetsk on 7 February 1857. Frank, *op. cit.*, pp. 213-16.

mighty talent; while she was totally overwhelmed by poverty on her husband's death.

In any case Dostoevskii let me know of all his plans. We arranged that at the very beginning of the winter, after I was settled in Barnaul, he would come to stay with me for a while and there he would finally decide his fate, and in the event that his correspondence with her had the desired outcome and his means permitted, he would go to her in Kuznetsk, would marry her, come back to me in Barnaul with her and her child and, after staying with me for a while, would return and settle in Semipalatinsk, where he would stay until his complete amnesty came through.

With these pre-suppositions, both my meeting with Fedor Mikhailovich and my travels of 1856 ended, and I returned for the winter to Barnaul at the beginning of November 1856.

## CHAPTER 3

# Second journey to the 'Tian'-Shan'

*My arrival in Barnaul in the winter of 1856–7, and F. M. Dostoevskii's visit to me. My journey to Omsk and talks with G. I. Gasfort. Arrival in Semipalatinsk and meeting with Dostoevskii and the artist Kosharov. Traverse through Kopal and the Pri-Ili plain to Vernyi. Trans-Ili territory. Second journey to the Tian'-Shan'. Political situation in the Issyk-kul' basin. Departure. Lake Dzhasyl-kul'. The court of biys and my participation in it. Hospitality of Sultan Ali and of his son Ables. Sultan Tezek. Merke. Arrival to Sultan Burambai and the assistance which we rendered to him.*

Having arrived at Barnaul after my journey to Semirech'e in the late autumn of 1856, I found the hospitable Vasilii Apollonovich Poletika there no longer. 'Barnaul's Alcibiades',<sup>1</sup> as I called him jokingly, had left permanently for Petersburg to seek his fortune there. Having quite substantial capital, he decided to try the power of his remarkable talents and brilliant eloquence in the field of public affairs which had sprung up in Petersburg, and that was what he fully succeeded in doing, though not before 1861, during the epoch of the upsurge of industrial enterprises, for which he felt more prepared than others.

The winter of 1856–7, which I spent in hospitable Barnaul, did not seem boring to me. I rented quite a cosy furnished apartment of a few rooms for twenty-five rubles a month. The days passed in sorting out the rich botanical and geological collections which I had gathered, in detailed examination and study of the articles in the Barnaul museum, in using the local library and in familiarizing myself with the factory work; the evenings I spent in Barnaul's hospitable, well educated and always welcoming society. The winter season was enlivened by amateur performances in the excellent building of the Barnaul theatre. Many

<sup>1</sup> The allusion is to the Athenian statesman and commander (451–404 BC) and kinsman of Pericles. The comparison is not entirely flattering to Poletika because Alcibiades' character was marked by flippancy, arrogance and egoism, as well as courage and an urge to live life to the full. After Pericles' death, Alcibiades unscrupulously supported an anti-democratic faction and deservedly acquired a reputation for opportunism and double-dealing, scheming his return to military power after being exiled from Athens for treachery during the war with Sparta. Bury, *History of Greece*, pp. 459–71; W. Smith, *Smaller History of Greece*, pp. 92–136.

members of Barnaul society were remarkable for their wonderful stage talents. An absolutely first-class comic actor was Samoilov, a mining engineer, the elder brother of the famous actor, who excelled even his younger brother in his natural theatrical talent and already stood out at the time when both of them were studying at the Mining College. Generally the animation and the level of culture of this beautiful corner of Siberia, which I nicknamed the 'Siberian Athens', made my stay there especially attractive during the cold winter season of Siberian blizzards.

A depressing impression was made upon me only by the fact that all this intelligent, cultured society (belonging, with the exception of two or three owners of gold-mines, to the Altai mining administration) lived above their means, supplied by the extremely meagre official wage, and obviously enjoyed incomes which were over and above it, and which were not determined by the law but were arbitrarily obtained from the serf population of the Altai mining region.

But it was obvious that such 'self-rewarding' took place here neither in that crude form so widespread in Russian provincial backwoods, which Gogol' depicted so artistically in his *Government Inspector*, nor in that form, equally widespread in Russian provincial towns, of supplementary benefits granted by tax-farmers to all higher officials of the provincial administration, except those of them who possessed the gift, rare in the mid-nineteenth century, of 'the disinterestedness of Aristides',<sup>1</sup> enabling them to refuse the tax-farmer's custom-hallowed payments. In Barnaul in the middle of the nineteenth century the mining administration worked out for itself a form of self-recompense from the incomes of the serf population of the district; this form was a consequence of the obligatory nature of serf labour.

However, produced and maintained by serfdom, the system of 'self-recompense' among the ranks of the Altai mining district, in which monetary payment substituted for duty paid in kind, fell on the old inhabitants of the peasant population who were registered in Altai, and was not particularly burdensome for those Altai peasants, who enjoyed prosperity and did not complain of their oppression by the mining administration. The number of working days which yearly fell on each peasant was very moderate, while peasants for whom it was difficult to serve out their duties in kind, due to the type and timing of their farm work, were able to supply substitutes instead of themselves through the mediation of mining officers.

This is how the Altai administration derived its 'self-recompensing' from such substitution. In addition to the 30,000 males, including teenagers, who worked in the mines and were in the position of house-serfs on estates, that is they did not own land (except household plots) and received their upkeep from the Cabinet, 150,000 male peasants had been ascribed to the Altai mining region, and

<sup>1</sup> Aristides 'the Just' (529-468 BC), Athenian statesman.

they were endowed with 3.5 million *desiatiny* [approximately 3.8 million hectares] of conveniently situated fertile land, for the use of which they were obliged to perform duties in kind in relation to the mines and factories, labouring both on foot and with horses. These duties consisted mainly in the transportation of ores from the mines to the works, the cutting and transportation of wood, burning and transporting charcoal, and various auxiliary tasks in the factories and mines.<sup>1</sup> For all this labour the peasants were called up several times a year, but always for fairly short periods, to those factories and mines at which they were obliged to perform these duties together with their horses. For peasants living near the factories or mines, this service in kind was comparatively light, but for those who lived at a distance from the places to which they were called up (sometimes hundreds of *versts* away), to be detached from their agricultural work for perhaps a week at a time, and losing still more time in travel, would be a disaster. Therefore, well-off Altai peasants considered it a blessing that they were granted the right of substituting peasants from settlements in the vicinity of the factories; and they were particularly glad to accept the proposal of the mining officials, who took upon themselves the hiring of workers for them at a far cheaper rate than that for which the peasants could have hired them. It was these sums paid out for voluntary hiring that came into the hands of the mining administration, constituting a special revenue for it, the amount of which depended on calculations which were in the hands of the administration, and by their very nature were not subject to any external accounting or control. The basis for this calculation was the number of working days falling to the 150,000-strong peasant population of the Altai mining region, who were obliged to smelt 1,000 *puds* of silver for the Cabinet annually, while the number of working days depended on the quantity of ores conveyed to the factories and smelted there. Of course, the quality of the content of the ores extracted at various mines differed greatly, and the technology of the process itself required the mixing of richer and less rich ores, of refractory and fusible ores. In these conditions, for each factory the quantity of ore to be smelted was determined before the beginning of the year, and for each mine the quantity of ore to be extracted in order to obtain the required 1,000 *puds* of silver; similarly, the quantity of charcoal required, and hence the overall number of working days required for the whole year's production, which was then apportioned among the Altai peasant population, with a precise indication for each peasant at which factory or mine his labour was required. In general, despite the fact that the average ore content was defined as being considerably lower than it was in reality, while the quantity of ore from which 1,000 *puds* of silver could be extracted was considerably exaggerated, and

<sup>1</sup> For auxiliary serf labour in the Urals ironworks, see Chapter 1, p. 6, n. 2. At Nizhnii Tagil in the 1890s, for example, of 3,500 workers only 800 men were actually in the foundries, the remainder being auxiliaries.

the calculation of the number of working days needed for the annual production also considerably exceeded the actual requirement, the service in kind required of the Altai peasants was moderate. Further, the arranged substitution converted the obligation into a monetary one, which, since it was not needed for mining production, was channelled into a special, non-legitimated source of revenue for the whole Barnaul mining administration, and this revenue was divided by the local authorities among all the members of the local administration in accordance with their activity.

In January 1857 I had the pleasure of a visit from F. M. Dostoevskii. Having settled by letter beforehand with the one who had finally decided to join her fate with his, he was going to Kuznetsk in order to arrange his wedding there before the beginning of Lent.<sup>1</sup> Dostoevskii stayed with me for about two weeks making necessary preparations for his wedding. We spent several hours a day in interesting conversations and in reading chapter by chapter his *Notes from the House of the Dead*,<sup>2</sup> which was not yet finished, and which was supplemented by oral stories.

It is understandable what a powerful, tremendous impression this reading made upon me, and in what a lifelike way I was transported into the awful conditions of life of the sufferer, who with a spirit more than ever pure and with an enlightened mind had emerged from the difficult struggle, in which 'a heavy hammer, by crushing glass, forged the sword'.<sup>3</sup> Of course, no other writer of such stature was ever placed in more favourable conditions for the observation and psychological analysis of people who were most diverse in their character, and with whom it was his lot to live for so long. One may say that it was his stay in 'the house of the dead' that made a great psychological writer of the talented Dostoevskii.

But this means of development of his natural talents did not come easily to him. He remained in poor health for the rest of his life. It was painful to see him in his fits of epilepsy, which recurred at that time, not only periodically but even quite frequently. Moreover, his material circumstances were most difficult, and in entering family life he had to prepare for all sorts of hardships and, one may say, for a hard struggle for existence.

I was happy that I was the first to encourage him through personal interaction with my deep conviction that in *Notes from the House of the Dead* he already had capital, which would safeguard him from distressing need, and that the rest would come very soon of its own accord. Enlivened by hope for a better future, Dostoevskii went to Kuznetsk and in a week returned to me in the very best spirits with his young wife and step-son, and, having stayed with me another fortnight, he then left for Semipalatinsk.

<sup>1</sup> For the traditions surrounding Lent in Russia, see Rozhnova, *Russian Folk Calendar*, pp. 65-70.

<sup>2</sup> *Notes from the House of the Dead* was first published in 1860-62.

<sup>3</sup> A quotation from Pushkin's *Poltava* (1828) I, 148.

After Dostoevskii's departure my main concern was to travel to Omsk at an appropriate time at the end of winter in order to have talks with the Governor-general and from early spring to make arrangements for my firmly planned expedition of 1857 into the heart of the Tian'-Shan', which I had already mapped out for scientific research. At the same time, before going to Omsk, I had already agreed in advance by letter with the artist Kosharov, who was in Tomsk in the capacity of teacher of drawing at the *gimnaziia*, inviting him to accompany me during the proposed journey to the Tian'-Shan'. Kosharov agreed, and I arranged to meet him at the end of April 1857 in Semipalatinsk.

On my arrival at Omsk General Gasfort received me extremely affably. He was interested to the highest degree in the impression made upon me by the Trans-Ili territory, which he had acquired modestly and almost imperceptibly for the Petersburg authorities. Having already got to know me quite well, G. I. Gasfort realized that my appraisal of his activities in the territory with which he was entrusted would be not only impartial but also quite authoritative, and the main thing was that, if conveyed to influential circles in Petersburg, it could be of considerable benefit to the undertaking which he had initiated. Therefore, I considered it my duty to express my opinion quite candidly to Gustav Ivanovich on the issues in which he was interested. I told him first of all that I had no doubt that the Trans-Ili territory occupied by him, well secured by peaceful Russian colonization, would become one of the pearls of the Russian domains in Asia. In so doing I took the opportunity to express some general views on our attitudes towards the tribes of Central Asia.

I found it absolutely abnormal that we, being already in quite firm possession of a vast expanse of Central Asia, occupied by the numerous nomadic population of Kirgiz hordes and steppes, maintained our frontier not beyond this expanse, but behind it, along the old line of Cossack outposts, from the mouth of the Ural along and up its course and then to Petropavlovsk and along the Irtysh towards Omsk as far as Zaisan. Travelling across the lands of the Kirgiz of the Middle and Great Hordes, I had become convinced how difficult it was to govern this nomadic population from Omsk, and especially to safeguard it from the raids and depredations of the neighbouring non-Russian subjects, without having firm strong-points inside the country and especially beyond it. In this respect beautiful, flourishing Kopal and the new settlements of Lepsinsk and Urdzhar *stanitsy* in Semirech'e and on the southern slope of the Tarbagatai stood Russia in good stead.

But it was also possible to expect incomparably much more from the newly occupied Trans-Ili territory. Here, with the aid of our colonization, we could establish the strongest and the most invincible stronghold for Russian influence and dominion in Central Asia.

At the same time the existence of such a firm stronghold would already soon allow implementation of what seemed to be absolutely essential to ensure possession and control of the Kirgiz hordes and steppes, namely the transfer of our



state border to the far side of them, from the long Ural-Orenburg-Siberian-Irtysh line to a short frontier line, by means of which it would be possible to join Vernyi and our already existing fortifications on the Syr-dar'ia at Fort Perovskii.<sup>1</sup> This is why I considered the occupation of the Trans-Ili territory and its stable colonization to be no less a major service to Russia than occupation of the Pri-Amur territory, a service which later history would appreciate, and meanwhile everything that would be undertaken for the scientific exploration of the newly-acquired territory would be 'a beacon of science', brought for the first time into the very heart of the Asian continent.

My ideas pleased Gasfort very much. In particular he liked the appraisal of the importance of occupation of the Trans-Ili territory. My proposal for drawing a state frontier-line on the far side of our Kirgiz regions, leaning for support on Vernyi and Fort Perovskii, seemed to him to be very tempting, but he lacked the enterprise and energy of a Murav'ev-Amurskii to accomplish such a bold scheme.

However, Gasfort, as an experienced and courageous commander, was not afraid of any clashes which might occur with the neighbouring khanates of Turkestan, yet he proved a complete coward with regard to his responsibility before the Petersburg authorities, being afraid of losing his high official position, which unfortunately he valued more than the interests of his adopted fatherland, though he served it quite conscientiously.

Therefore, he did not even dare to raise the question about transferring the state border beyond the Kirgiz steppes to the southern outlying districts of our Central Asian domains, but decided to continue consolidation of our domains in the Trans-Ili territory and its colonization, since in this work he did not encounter any obstacles, either from Petersburg or even on the part of the Chief Administration of Western Siberia. As for scientific research in the Trans-Ili territory, attaching great importance to his reputation as an enlightened European, he regarded it with great sympathy, and hence easily consented to all my applications relating to my journey in 1857.

However, in spite of all the benevolence of the Governor-general towards my explorations in Trans-Ili territory, I did not reveal my travel plans to him in detail and contented myself only with soliciting, in the most general outline, permission to visit Lake Issyk-kul' and its neighbouring mountains, without even mentioning the unfamiliar name of Tian'-Shan'.

I suggested to him to leave all the details of my provision to my agreement with the local authorities, asking him only to order them to give me an escort in sufficient number for local circumstances to ensure my safety. The Governor-general consented to everything with pleasure, laying down only one restricting

<sup>1</sup> Fort Perovskii was founded by General Vasilii Alekseevich Perovskii (1795-1857) on the site of the Kokandian fort of Ak-Mechet, which was captured on 28 July 1853 after a 26-day siege. As Perovsk, it became an *uezd* town in Syr-dar'ia *oblast'* and was later re-named Kzil-Orda.

condition, namely not to cross the river Chu, which did not hinder me at all as it was a lot more convenient for me to get to the 'Tian'-Shan' by going round the eastern extremity of Issyk-kul' rather than the western one.

After my very successful talk with the Governor-general it only remained for me to get ready, little by little, for my journey of 1857, which could not start before the arrival of spring and was scheduled for about 20 April. At this time of year the Irtysh was still covered with ice, and I had to travel for a distance of 800 *versts* from Omsk to Semipalatinsk along the main Siberian frontier-line, partly by sledge, and partly on wheels.

I left Omsk on 21 April in the evening by post-chaise. Outside the town the road had almost dried out, but in places there were snow drifts. The night and morning were cold and dull. Only by two o'clock in the afternoon of the 22nd the sun shone and it became warmer, but here and there were visible the still frozen Irtysh bends, on the banks of which there rose high sand dunes; all around stretched the bare monotonous steppe, in which organic nature had not yet awakened.

On 23 April in the morning I was in Chernoretskaia *stanitsa*. The weather was bright and quite warm. My carriage was transported with difficulty across the frozen Irtysh. In Iamyshevskaja *stanitsa* I saw old cast-iron cannons and cannon-balls, testifying to the past strategic importance of this fortress.

On 24 April in the morning I was in Grachovskaia *stanitsa*. It was raining in the morning, but by eleven o'clock the weather had cleared up and it became hot. On the southern side of the Irtysh stretched out the dismal steppe, but further on from the north a pine forest came close to it.

Towards evening on 26 April I reached Semipalatinsk by carriage. In Semipalatinsk I saw Dostoevskii in the best of spirits: his hopes for a complete amnesty and restoration of his civil rights were by now justified; he was still oppressed only by the precariousness of his material position. In Semipalatinsk I found my *tarantas*, which I had left there in the autumn, and met the artist Kosharov, who had arrived from Tomsk. On 27 April we left the town. The crossing of the Irtysh was accomplished in a clumsy long boat pulled by horses tied to it by their tails. The shore ice was thrown about in picturesque piles on the left bank of the Irtysh.

Beyond the Irtysh I now travelled in my *tarantas*, to which Kirgiz post-horses were harnessed. Our route went across steep slopes, on which grey-green grass of Asian types of wormwood (*Artemisia*) was only just breaking through. Only by evening did we reach Uluguzskaia picket; we continued our journey from there overnight, getting stuck in salt-marshes, and only by dawn dragged ourselves to Arkalyk.

I fell soundly asleep in my *tarantas* on the way and awoke on 28 April at half past four in the morning ten *versts* the other side of Arkalyk. The morning was foggy, but to my untold joy, the character of the surrounding nature was much changed. The snow-sheets and dirty salt-marshes had disappeared, and there

appeared the first flowers of the spring steppe flora: first, golden *Adonis vernalis* and pale grey *Physochlaena physaloides*, and then bright yellow buttercups (*Ranunculus polyrrhizus*) and fascinating three-coloured tulips (*Tulipa silvestris* and others), enlivening the steppe and covering it in incalculable numbers. Here and there on the steppe there appeared beautiful yellow carpets of flowers, which consisted of two species of subtle, delicate gagea (*Gagea minima* and *G. bulbifera*) and small buttercups (*Ceratocephalus orthoceras*). In rocky places the steppe was enlivened by a multitude of birds, namely steppe grouse (*Pterocles*), and, in places rich in water, geese and ducks.

Among the floral carpets, on which I continually kept jumping from my *tarantas* to collect interesting plants of the steppe spring flora,<sup>1</sup> there were crawling in multitudes beautiful spring beetles of the family of steppe wood-cutters (*Cerambycidae*), namely different species of *Dorcadion*, among them the beautiful *Dorcadion abacumovi*, named in honour of Abakumov.

During the day there appeared the picturesque Arkat mountain group, which Kosharov sketched, as well as a picturesque Kirgiz cemetery, which we came across.<sup>2</sup>

We spent the night at Uzun-bulak. On 29 April, on a cold, foggy morning we reached Ingrekei, where we had tea. Five *versts* after Ingrekei we forded the shallow river Ashchi-su. On 30 April we crossed the flooded river Aiaguz by boat, without stopping in the dreary town which held no interest for me. By contrast, further along on my route the steppe presented itself to me in luxuriant attire. Before us there spread out whole carpets of my favourite spring lilac anemones (*Pulsatilla patens*), which drooped gracefully on their fluffy stems, and also of delicate pale lilac, semi-transparent *khokhlatka* (*Corydalis ledebouriana* and *Cor. schangini*), swayed by a light breeze, and even more extensive carpets of three-coloured tulips (*Tulipa altaica* and *Tulipa silvatica* var. *tricolor*). Here and there beautiful, huge leaves of rhubarb (*Rheum leucorrhizum*) came out of the ground.<sup>3</sup>

<sup>1</sup> [Semenov:] These plants were collected by me on 28 April in the Arkat mountains, besides those mentioned above: *Gypsophila paniculata*, *Geranium tuberosum*, *Caragana aurantiaca*, *Hedysarum gmelini*, *Spiraea trilobata*, *Sp. hypericifolia*, *Potentilla pensylvanica*, *Umbilicus leucanthus*, *Umb. spinosus*, *Seseli tenuifolium*, *Tanacetum fruticosum*, *Artemisia maritima*, *Art. frigida*, *Saussurea crassifolia*, *Sauss. rigida*, *Glaux maritima*, *Atriplex cana*, *Obione verrucifera*, *Calidium foliatum*, *Suaeda salsa*, *Petrosimonia brachiata*, *Potamogeton perfoliatus*, *Allium subtilissimum*, *Triticum prostratum*, *Poa bulbosa*, and of ferns: *Polypodium vulgare* and *Asplenium septentrionale*.

<sup>2</sup> Kosharov's sketches of the Arkat mountains and the Kirgiz cemetery do not seem to be in the Russian Geographical Society's collection in St Petersburg.

<sup>3</sup> [Semenov:] Besides the plants already named, the following were found here on 30 April. Of Cruciferae: *Megacarpaea laciniata*, *Leptaleum filifolium*, *Sisymbrium brevipes*; of the family of pinks: *Silene viscosa*, *Sil. altaica*, *Arenaria longifolia*, *Cerastium maximum*; of Leguminosae: *Caragana frutex*, *Astragalus unilateralis*, *Astr. arbuscula*, *Astr. lagocephalus*; of Rosaceae: *Rosa platyacantha*; of Umbelliferae: thorny *Eryngium planum*; of Compositae: *Codonocephalum grande*; of Solanaceae: *Physochlaena physaloides*; of Scrophulariaceae: *Linaria odora*; of Plumbaginaceae: *Goniolimon callicomum*; of *solianka*: *Petrosimonia crassifolia*; of cereals: *Aristida pennata*; the following water plants I collected in the River Aiaguz itself: *Myriophyllum verticillatum*, *Potamogeton natans* and *Pot. perfoliatus*.

On 1 May it was already hot in the steppe by morning. Half-way to Malo-Aiaguz picket I saw the grave of Kozi-Korpech, made famous in the Kirgiz steppe by folk legends. Its top, unfortunately, had been demolished by a cannon ball. Who had felt such an act of vandalism necessary I could not discover. The steppe was enlivened here by newly appearing forms of vegetation.<sup>1</sup> That day we had to cross boggy *solontsy*, alternating with sandy areas. On some of these salines we saw real salt encrustations of sodium chloride and Glauber's salt. On the sandy hills there were thickets of *saksaul* (*haloxylon* – *Arthrophytum ammodendron*). The sands were populated with numerous tortoises and lizards, among which there were round-headed ones (*Phrynocephalus*).

On 2 May we reached Arganat picket very early in the morning, this time in completely clear weather, and climbed the Arganat knoll, from which the view was very extensive. To the west in the slightly foggy distance there spread the surface of Lake Balkhash, and to the east, partially covered with clouds, the snowy crest of the Semirechensk Alatau. I changed over to a horse and set out on an excursion across the low-lying Pri-Balkhash steppe. The Arganat group and surrounding steppe afforded me a very interesting collection of plants.<sup>2</sup>

On our return to the Arganat picket Kosharov and I changed to my *tarantas* at two o'clock in the afternoon and quickly reached the river Lepsa, on the banks of which there were growing many shrubs: hawthorn (*Crataegus sanguinea*), honeysuckle (*Lonicera tatarica*) and a species of willow (*Salix purpurea*). We crossed the Lepsa on a ferry. The weather became dull, and finally it started raining, but still before nightfall we reached the Baskan,<sup>3</sup> another river of Semirech'e, and it was already night when we reached the Ak-su, the third significant river, the fording of which was very difficult.

On 3 May in the rain we travelled over the steppe, through terrible mud as far

<sup>1</sup> [Semenov:] That day (1 May) I found the following interesting forms of vegetation in the Aiaguz steppe: of Leguminosae, liquorice (*Glycyrrhiza aspera*), *Halimodendron argenteum*, *Astragalus buchtarmensis*; of Compositae: *Tragopogon ruber*; of *burashnikovii*: forget-me-not (*Myosotis silvatica*), which covered extensive spaces with their bright blue carpets, and *Rindera tetraspis*; of *kasatikovii*: *Iris tenuifolia*, and of Liliaceae: a beautiful and rare *Fritillaria* (*Rhinopetalum*) *karelini*.

<sup>2</sup> [Semenov:] Here is the list of interesting plants collected that day (2 May) in the Arganat area: *Thalictrum isopyroides*, *Mentococcus linifolius*, *Farsetia spathulata*, *Astragalus stenoceras*, *Vicia subvillosa*, *Veronica cardiocarpa*, *Euphorbia rapulum*. But in this locality the most interesting thing of all for me was the discovery of three hitherto completely unknown plant forms, which later received the names: *Astragalus arganatiacus*, *Astr. chlorodontus*, *Hedysarum semenowi*. They were described in F. Regel and F. ab. Herder, 'Enumeratio plantarum in regionibus cis- et transilensibus a cl. Semenovio anno 1857 collectarum' (*Bulletin Soc. Natur. Mosc.*, 1864, 1866, 1867, 1868, 1870, 1872).

<sup>3</sup> [Semenov:] The steppe between the rivers Lepsa and Baskan supplied us with a new interesting 'catch', which consisted of the following plants: *Clematis orientalis*, *Psilonema dasycarpum*, *Lepidium perfoliatum*, *Ruta sieversii*, *R. latifolia*, *Melilotus officinalis*, *Astragalus flexus*, *Hulthemia persica* (*berberifolia*), *Crataegus sanguinea*, *Tamarix laxa*, *Saussurea coronata*, *Solenanthes circinnatus*, *Cystanche salsa*, *Suaeda physophora*, *Salsola affinis*, *Atraphaxis lanceolata*, *Salix purpurea*, *Populus sauveolens*, *Populus euphratica*, *Carex oederi*, *Hierochloa odorata*, *Crypsis aculeata*.

as a stony incline to a high spur of the Semirechensk Alatau through the Keisykauz gorge and the Gasfort pass. However, when we drove up the slope over hard rocky soil, the weather completely cleared and our whole journey through the gorge, the pass and descent to the Arasan, adorned with luxuriant vegetation, which was no longer lowland steppe, but of foothill zone type (from 700 to 1,000 metres), was extremely attractive.

The whole journey that day I devoted to a study of the flora of the foothill zone of the Semirechensk Alatau, in the evening I reached the Arasan and enjoyed a swim in it in an air temperature of 16°C.

In the course of the next four days (4–7 May) in splendid sunny weather and with temperatures of 17°C, I made a whole series of excursions (for example, to the mountains of the Keisykauz spur and the gorges of the rivers Biën and Karasu), riding in all directions from Arasan, and concluded a thorough study of the May flora of the beautiful, cultivated foothill zone of Semirech'e at an altitude of 800 to 1,200 metres.

On 7 May I moved to Kopal. Hypsometric measurement in 1857 yielded 1,060 metres of absolute altitude for Kopal, and the foothills, which I visited from 3–8 May, mainly with the purpose of investigating the local flora, extended from 700 to 1,200 metres.<sup>1</sup>

<sup>1</sup> [Semenov:] Here is the list of plants which I found in the composition of the flora of this zone. Of Ranunculaceae: *Clematis songarica*, *Anemone biflora*; of the family of *dymiankovii*: *Corydalis schangini*, *Co. capnoides*, *Fumaria vaillanti*; of Cruciferae: *Arabis fruticulosa*, *Alyssum minimum*, *Draba muralis*, *Chorispora bungeana*, *C. tenella*, *Capsella procumbens*, *Cap. bursa-pastoris*, *Lepidium draba*; of the viola family: *Viola hirta*, *V. canina*; of the family of pinks: *Silene holopetala*, *Arenaria longifolia*, *Cerastium maximum*, *Cer. arvense*; of the geranium family: *Geranium sibiricum*, *G. albi-florum*, *G. pratense*; of the balsam family: *Impatiens parviflora*; of Leguminosae: *Medicago falcata*, *Trigonella polycerata*, *Trifolium fragiferum*, *Glycyrrhiza aspera*, *Caragana frutex*, *Halimodendron argenteum*, *Astragalus cognatus*, *Astr. petraeus*, *Astr. arbuscula*, *Astr. sieversianus*, *Astr. ellipsoideus*, *Astr. pallasi*, *Hedysarum songaricum*, *H. obscurum*, *v. lasiocarpum*, *Sophora alopecuroides*; of Rosaceae: *Prunus prostrata*, *Spiraea hypericifolia*, *Potentilla sericea*, *Pot. chrysantha*, *Rosa platyacantha*, *Rosa acicularis*; of the cypress family: *Epilobium hirsutum*; of tamarisk family: *Myricaria alopecuroides*, *Tamarix pallasi*; of currants: *Ribes heterotrichum*; of Umbelliferae: *Schultzia crinita*, *Bupleurum exaltatum*; of the honeysuckle family: *Lonicera hispida*, *Lon. microphylla*; of the valerian family: *Valeriana plagiostephana*, *Val. petrophila*; of the lanate family: *Dipsacus azureus*, *Scabiosa olivieri*; of Compositae: *Aster trifolium*, *A. (Rhinactina) limonifolius*, *Tanacetum fruticosum*, *Artemisia juncea*, *Centaurea squarrosa*, *Acroptilon picris*, *Scorzonera tuberosa*, *Ligularia macrophylla*, *Echinops ritro*, *Cousinia microcarpa*; of Gentian family: *Erythraea pulchella*, *Gentiana barbata*; of the convolvulus family: *Convolvulus lineatus*, of Boraginaceae: *Heliotropium europaeum*, *Nonnea picta* and *Asperugo procumbens*; of Solanaceae: a form of vegetation, newly discovered by me, which later received the name of *Physochlaena semenovi* n. sp.; of Scrophulariaceae: *Linaria macroua*, *Scrophularia scopolii*, *Scr. incisa*, *Dodartia orientalis*, *Pedicularis physocalyx*; of the zarazikhovii: parasitic *Orobanche cernua*; of Labiatae: *Salvia silvestris*, *Ziziphora clinopodioides*, *Dracocephalum nutans*, *Scutellaria orientalis*; of solianka: *Anabasis phyllophora*, *Nanophyton erinaceum*; of Amaranthaceae: *Amarantus paniculatus*; of the berry family: *Diarthron vesiculosum*; of euphorbia: *Euphorbia chamaesyce*, *Euph. lucida*; of Cannabaceae: *Cannabis sativa*; of Typhaceae: *Typha stenophylla*; of the orchid family: *Orchis incarnata*; of the iris family: *Iris guldenstaedtiana*, *Ir. glaucescens*; of Liliaceae: *Tulipa gesneriana*, *T. altaica*, *Gagea chlorantha*, *G. bulbifera*, *Fritillaria ruthenica*; of Graminaceae: *Poa bulbosa*; of ferns, *Woodсия ilvensis*.

My meeting with Abakumov was most amicable. He particularly enjoyed showing me his entomological collections.

We left Kopal on 9 May along the upper Balyktinsk road over the mountains to Karatal. After about ten *versts* we reached granite outcrops and drove into a zone of beautiful spruce-silver fir forest. On leaving this zone the uphill slope was became steeper and steeper, and the vegetation assumed a sub-alpine character.<sup>1</sup> We were not able to reach the top of the Aral-dzhol pass, for which we were heading, as it turned out that it was still heavily snow-bound. At the highest point which we reached, now in the alpine zone, I made a hypsometric measurement, which gave 2,180 metres of absolute height. My botanical collection that day was particularly fortunate. Among other things, I found four absolutely new forms of plant, namely a new type of astragal, which later received the name of *Oxytropis nutans n. sp.*, a new kind of saffron, to which together with Dr Regel<sup>2</sup> I gave the name of *Crocus alatavicus n. sp.*, a new form of carnation (*Dianthus alpinus var. semenovi n. sp.*) and finally a new type of *mytnik* (*Pedicularis*), also later named after me (*Pedicularis semenovi n. sp.*).<sup>3</sup> From our bivouac in the alpine zone we descended and came out to a lower road, along which we reached the Karatal.

On 10 May in the morning we forded the full Karatal with difficulty, and by evening reached the Karasu picket. Here I spent the night and the next day in the morning made a hypsometric measurement, which gave 1,180 metres.

The next day, 11 May, I spent travelling in overcast conditions to Kuian-kuz with relays of post-horses. That same day during my excursion on the mountain

<sup>1</sup> [Semenov:] In the wooded zone of the Semirechensk Alatau in 1857 the following plants were collected by me: *Pulsatilla albana*, *Ranunculus polyanthemus*, *Trollius asiaticus*, *Paeonia anomala*, *Cerastium davuricum*, *Cer. arvense*, *Geranium pratense*, *Caragana frutex*, *Astragalus petraeus*, *Umbilicus alpestris*, *Ribes heterotrichum*, *Schultzia crinita*, *Lonicera hispida*, *Rhinactina limonifolia*, *Matricaria ambigua*, *Alfredia nivea*, *Serratula trautvetteriana n. sp.*, *Pyrola rotundifolia*.

<sup>2</sup> Eduard-August Regel (1815–92) was Director of the Imperial Botanical Gardens at Petersburg from 1855 until 1892. After work in the Botanical Gardens at Göttingen in 1832–7, he studied botany under Bartling and subsequently worked at Bonn and Berlin before becoming head of the Botanical Gardens in Zurich in 1842, while simultaneously lecturing at the University there. Moving to St Petersburg he raised the status of its gardens to become one of the best in Europe, founding the Botanical Museum and Laboratory, in addition to establishing the Imperial Russian Horticultural Society, of which he was Vice-president. Regel edited several horticultural journals and wrote extensively, his main works being *Russkaia pomologiia* and *Russkaia dendrologiia* (1871–82).

<sup>3</sup> [Semenov:] Here are the remaining plants collected by me after 9 May 1857 in the alpine zone of the Semirechensk Alatau (besides the four named new forms): *Ranunculus hyperboreus*, *Ran. altaicus*, *Papaver alpinum*, *Glaucium squamigerum*, *Corydalis gortshakovi*, *Parrya stenocarpa*, *Erysimum cheiranthoides*, *Chorisporea sibirica*, *Viola grandiflora*, *Alsine verna*, *Astragalus petraeus*, *Hedysarum obscurum*, *Potentilla opaca*, *P. nivea*, *Umbilicus alpestris*, *Sedum ewersi*, *Sed. hybridum*, *Saxifraga hirculus*, *Sax. sibirica*, *Erigeron aurantiacus n. sp.*, *Gnaphalium leontopodium*, *Doronicum altaicum*, *Dor. oblongifolium*, *Saussurea pygmaea*, *Primula algida*, *Androsace villosa*, *Androsace septentrionalis*, *Cortusa matthioli*, *Gentiana aurea*, *G. prostrata*, *G. olivieri*, *G. frigida*, *Myosotis silvatica*, *Eritrichium villosum*, *Gymnandra borealis*, *Dracocephalum altaicense*, *Dr. nutans*, *Dr. peregrinum*, *Gagea liottardi*, *Lloydia serotina*, *Fritillaria pallidiflora*, *Allium platyspathum*.

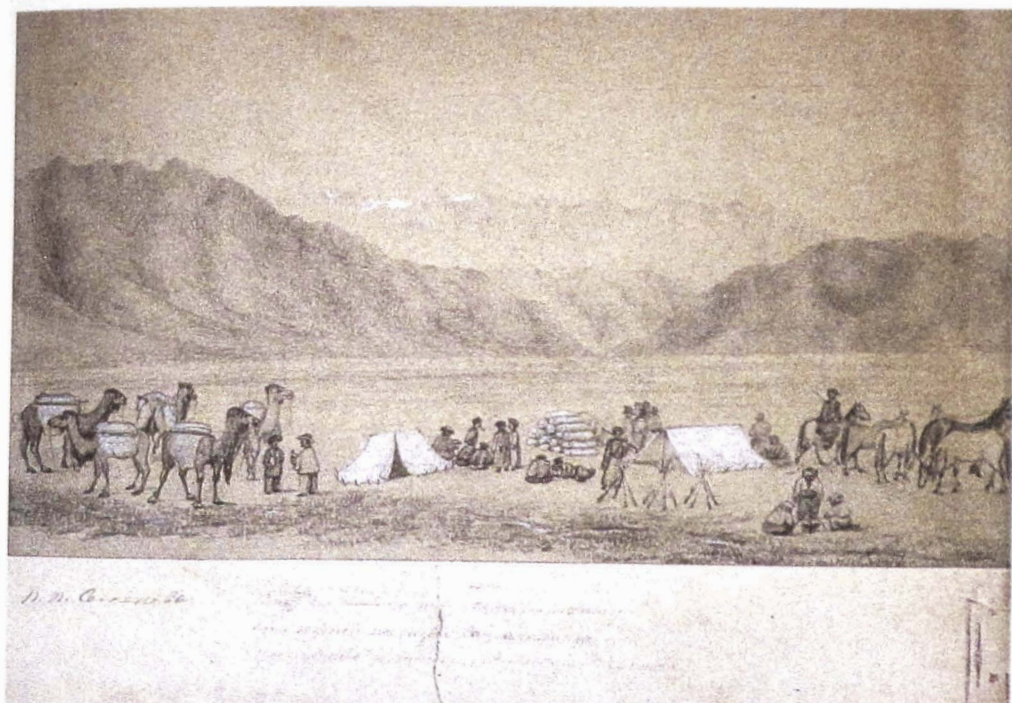


PLATE VI. Semenov's camp (no. 105)



PLATE VII. Square at Vernyi (no. 113)



PLATE VIII. Ascent of the Zauka (no. 50)



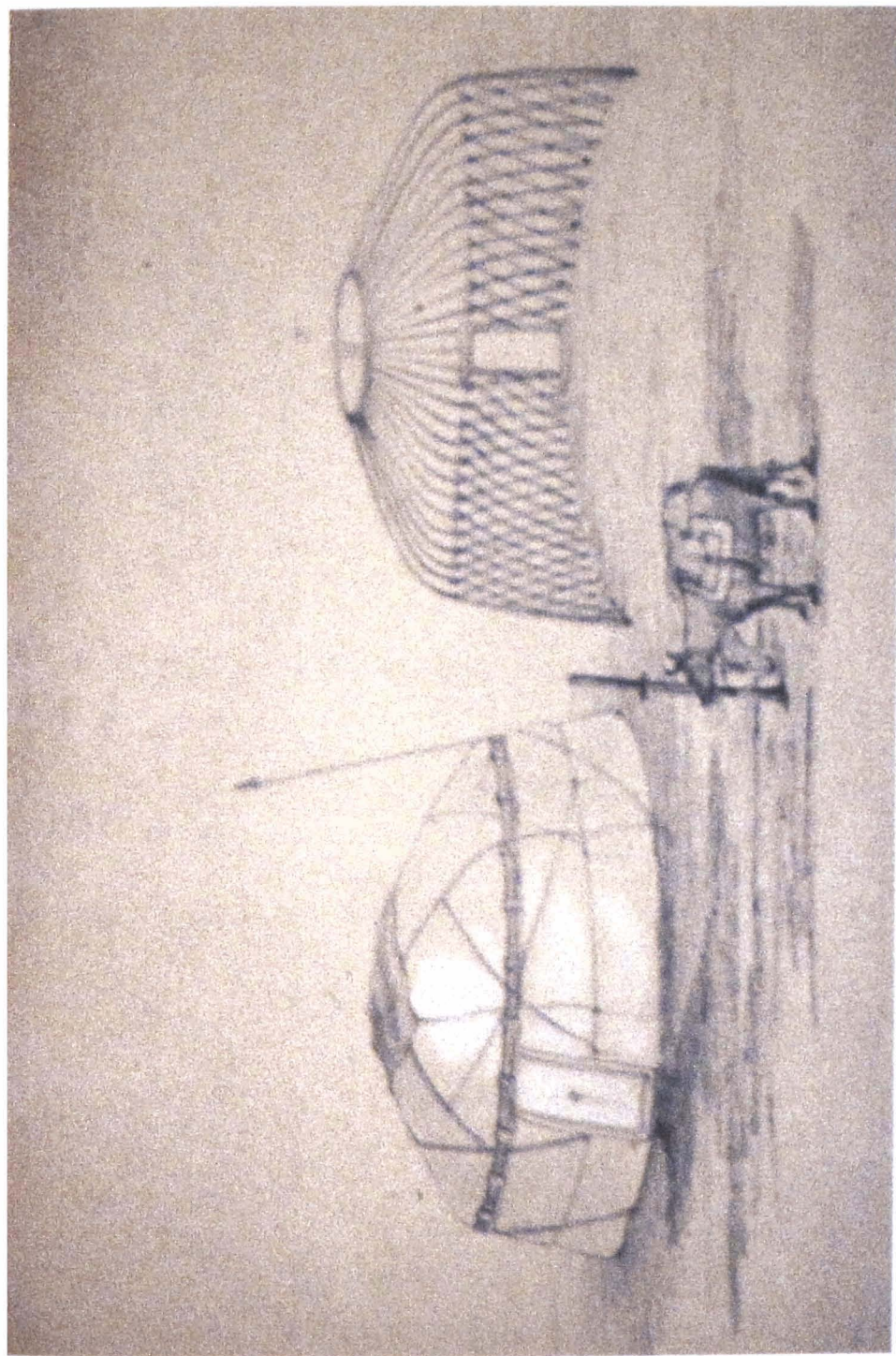


PLATE IX. Kirgiz iurts (no. 132)

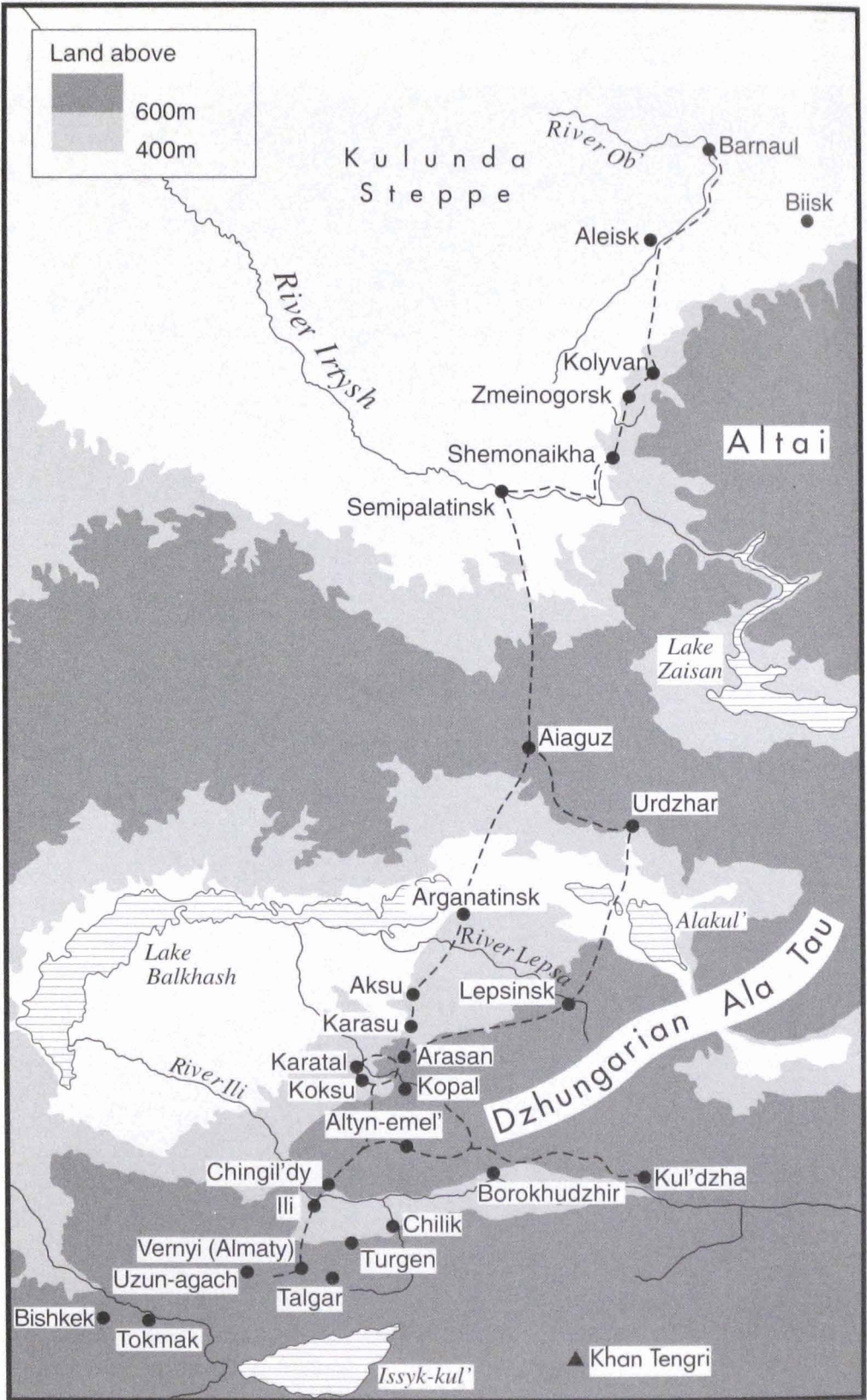


FIG. 3. First expedition from Barnaul to Vernyi

of Mai-tiube I managed to find two absolutely new types of plants of the families *ostrolodochnik* and astragal, which subsequently received the names: *Oxytropis semenovi* and *Astragalus semenovi*.

On 12 May, having spent the night in Kuian-kuz, I made a fascinating journey from there up to the Ili picket, which took me the whole day, as I continually got down from my *tarantas* and walked almost all the way on foot, getting to know the new world of the flora and fauna of the Central Asian lowland.

The Pri-Ili plain resembled a blossoming garden in its luxuriant, spring attire. All the Ili arboreal barberry, which had been discovered for the first time by Alexander Schrenk, who was the first of the explorers to reach Lake Balkhash as long ago as the forties, and which was named *Berberis integerrima* by Professor Bunge, was covered with large clusters of yellow, fragrant flowers. Of other deciduous arboreal species growing in the Ili lowland there were three types of poplar (*Populus euphratica*, *P. pruinosa* and *P. nigra*), three types of willow (*Salix songorica*, *S. alba*, *S. viminalis*), three types of tamarisk (*Tamarix elongata*, *Tam. pallasii* and *T. hispida*), a type of *dzhigda* (*Elaeagnus angustifolia*), and meadow-sweet (*Spiraea laevigata*); of shrubs: *Halimodendron argenteum*, *Ammodendron sieversi*, *Prunus prostrata*, *Hulthemia persica*, eglantine (*Rosa gebleriana*), and *Stellera altaica*. But the most interesting of all arboreal species on the Ili lowland turned out to be a hitherto unknown type of ash-tree, which formed whole small groves here in places; it was later (in 1868) described by Herder, a botanist at the Botanical Gardens, and was named by him *Fraxinus potamophila* n. sp. Besides this interesting tree, between 12 and 14 May in the Ili valley I managed to discover more than ten plants which were absolutely new and had not yet been described by anyone at that time, and which later received from Regel and Herder the following names: *smolevka* – *Silene semenovi* n. sp., *Acantophyllum paniculatum* n. sp.; *grabelki* [little rake] – *Erodium semenovi* n. sp.; *astragali* – *Astragalus halodendron* n. sp., *Astr. iliensis* n. sp.; *myshiny* [mouse pea] – *Vicia (Opobus) semenovi* n. sp.; *gorkusha* – *Saussurea semenovi* n. sp.; *Lactuca (Streptorhamphus) hispida* n. sp.; *kermek* – *Statice semenovi* n. sp.; *chesnok* [garlic] – *Allium iliense* n. sp.

No less than these hitherto unseen new forms of vegetation, among this original flora I was struck by a plant which was growing here in quicksand, in thickets of arboreal groves, which was striking by its tall and thick brown stem, devoid of leaves and furnished only with scales and penetrating vertically into the sandy soil. Moreover, the root of the plant, which is a direct continuation of the stem, has the same appearance as the stem. But the top of the stem ends with a long ear of thickly clustered purple flowers of a beautiful colour; at a great distance these flowers give off such a disgusting smell of carrion that the plant could be easily found in a forest thicket, but it was very difficult to dig it out from the soil due to the excessive depth of its root. This plant, which parasitizes on the roots of *Nitraria*, was discovered by me for the first time in Central Asia; however, it

turned out to belong to European-African flora of the Mediterranean basin, where it was already known to Linnaeus from the island of Malta and was named by him *Cynomorium coccineum* (of the family of Cynomoriaceae).<sup>1</sup>

The fauna of the Pri-Ili plain was no less original than its flora. It was populated by a countless multitude of tortoises (*Testudo horsfieldi*) and various lizards, mainly from the species of *Eremias*, *Scapteria* and *Phrynocephalus*; and also by a profusion of insects, chiefly coleoptera, crawling in damp, sandy, clayey places: a great many arachnids were encountered here too: *karakurt*, scorpions and phalangids. Among the coleoptera I found here for the first time a beautiful, smooth, metallic-coloured species of carabus of the genus *Calosoma* (specie *Callisthenes*); Ménétrier,<sup>2</sup> curator of the Zoological Museum of the Academy of Sciences, gave this new type the name of *Callisthenes semenovi*, under which it was described in 1859 by V. I. Mochulskii,<sup>3</sup> our famous entomologist, who processed my small entomological collection.

Only by the evening of 12 May, after these memorable excursions, I arrived at

<sup>1</sup> [Semenov:] Here are all the plants which I collected during those days on the Ili plain, and which therefore characterized the lower, hot steppe zone of the Trans-Ili district: *Adonis aestivalis* and *var. parviflora*, *Delphinium camptocarpum*, *Berberis integerrima*, *Leontice incerta*, *Glaucium squamigerum*, *Hypecoum pendulum*, *Euclidium syriacum*, *Malcolmia africana*, *Sisymbrium heteromallum*, *Sisymbrium loeselii*, *Silene nana*, *Silene semenovi n. sp.*, *Acanthophyllum pungens* and *A. paniculatum n. sp.*, *Erodium semenovi n. sp.*, *Tribulis terrestris*, *Peganum harmala*, *Aplophyllum sieversi*, *Nitraria schoberi*, *Halimodendron argenteum*, *Astragalus iliensis n. sp.*, and *A. halodendron n. sp.*, *Cousinia tenella* and *C. affinis*, *Amberboa moschata*, *Centaurea pulchella* and *C. squarrosa*, *Echenais sieversi*, *Lactuca viminea*, *Chondrilla juncea* and *C. brevirostris*, *Mulgedium tataricum*, *Androsace maxima*, *Fraxinus potamophila n. sp.*, *Cynanchum acutum*, *Arnebia decumbens*, *Hyosciamus pusillus*, *Lycium turcomanicum*, *Linaria odora*, *Dodartia orientalis*, *Veronica nudicaulis*, *Leptorrhombos micrantha*, *Orobanche amoena*, *Astragalus cognatus* and *A. spartioides*, *Astragalus turczaninowii* and *A. filicaulis*, *Astragalus sesamoides* and *A. sphaerophysa*, *Astragalus lanuginosus*, *Vicia semenovi n. sp.*, *Alhagi camelorum*, *Ammodendron sieversi*, *Prunus prostrata*, *Hulthemia persica*, *Rosa geblertiana*, *Tamarix elongata* and *T. pallasi*, *Tamarix hispida*, *Sedum rhodiola*, *Eryngium macrocalyx*, *Scandix pinnatifida*, *Cachrys herderi n. sp.*, *Karelinia caspia*, *Achillea trichophylla*, *Lallemantia royleana*, *Scutullaria orientalis*, *Lagochilus pungens*, *Eremostachys rotata*, *Statice otolepis* and *St. semenovii n. sp.*, *Chenopodium rubrum*, *Axyris amarantoides*, *Ceratocarpus arenarius*, *Agriophyllum lateriflorum*, *Salsola lanata*, *Salsola brachiata* and *S. rigida*, *Girgensohnia oppositifolia*, *Nanophyton erinaceum*, *Atraphaxis spinosa* and *Atr. frutescens*, *Atraphaxis pungens*, *Polygonum amphibium*, *Stellera stachyoides*, *Elaeagnus angustifolia*, *Chrozophora gracilis*, *Salix songorica* and *S. alba*, *Salix viminalis*, *Populus euphratica* and *P. pruinosa*, *Populus nigra*, *Potamogeton perfoliatus*, *Allium pallasi* and *A. stenophyllum*, *Allium delicatulum*, *Iris guldenstaedtiana*, *Agropyron orientale*, *Bromus tectorum* and *B. macrostachys*, *Phragmites communis*, *Lasiagrostis splendens*, *Stipa capillata*, *Heleochoa schoenoides*.

<sup>2</sup> Edouard Ménétrier (1802–61) an entomologist, having studied medicine and, later, natural history, worked at the Jardin des Plantes under Cuvier and Latreille. In 1821 he participated in Langsdorf's expedition to Brazil, and in 1829 led his own to the Caucasus. He became curator of the zoological collection at the Museum of the Petersburg Academy of Sciences and his many publications included contributions to Middendorf's *Reise in der Nord und Ost Sibierens* (1851), and a study of lepidoptera in Eastern Siberia, especially along the Amur river, in the *Bulletin de l'Académie des Sciences* (1859).

<sup>3</sup> Viktor Ivanovich Mochulskii (1810–71), entomologist and member of the Society of Investigators of Nature, Moscow, in whose journals most of his studies were published. His main research focused on beetles and his collection of specimens, which was left to the Zoological Museum at Moscow University, resulted from his travels in Siberia, Egypt, North and Central America.

Iliisk, where I found our Russian settlement had already been completely built up with excellent timber, after its preliminary and gradual drying out in the forest zone of the Zailiiskii Alatau. I stayed the night in Iliisk so as to make one more interesting excursion in the Ili valley the next day, accompanied by Kosharov, the artist, for forty *versts* down the river Ili.

On the day of that excursion, 13 May, the weather was absolutely favourable, and it was already 10°C when we set out on our journey at five o'clock in the morning.

In Iliisk the majestic river, which is 400 metres wide, still flows between low sandy banks across the plain, the absolute height of which does not exceed 340 metres, but which slowly rises to the south towards Vernyi, which is seventy *versts* away from Iliisk, gradually passing into the foothills of the Zailiiskii Alatau. The river Ili itself flows by Iliisk straight from east to west, and already seven *versts* below Iliisk its channel begins to cut into a rocky bed. Thus the full and fast-flowing river sinks deeper and deeper into a hollow, which it has scoured for itself between the crags. In consequence of this, following along the course of the Ili, we found ourselves fifteen or twenty *versts* below Iliisk in a rocky, although very wide, gorge.<sup>1</sup> Here the majestic river flowed between huge, cliff-like banks, which became higher and higher, but left a free passage between their precipices and the river-bed. About twenty or twenty-five *versts* below Iliisk the cliffs, rising more than a hundred metres above the level of the river and consisting of light red porphyry, become very picturesque, especially where they come close to the lucid, emerald-green, wide surface of the river. Numerous flocks of white pelicans (*Pelecanus onocrotalus*) were swimming in it and flying above it. I noticed a curious and very cleverly organized discipline in the movements of the flocks of these huge birds. Obviously, each flock had at its front experienced and careful look-out birds, in conformity with the movements and signals of which the whole flock moved, both in the water and in the air.

The main objective of our excursion down the Ili was Tamgaly-tash ('inscribed rocks'), an isolated terrain feature, which was at a distance of thirty to thirty-five *versts* downstream from Iliisk. Indeed, in the wide gorge, through which the river forced its way here, on a high cliff we found the huge characters of a Tibetan inscription, which I copied as best I could, with the help of artist Kosharov.<sup>2</sup> This inscription turned out to be not particularly ancient. It was apparently carved in the middle of the eighteenth century at the time of the Dzhungarian empire, when there were temporary camps of Khan Amursani here, and had the purpose of designating the western boundaries of Dzhungaria.

By the evening we returned to Iliisk, where we again spent the night, having covered no less than seventy *versts* there and back that day.

<sup>1</sup> Kosharov no. 108.

<sup>2</sup> Kosharov nos. 27 and 28.

On 14 May, in favourable weather, we moved to Vernyi, where I had to stay for two weeks for the final thorough organization of my expedition to the heart of the hitherto inaccessible Tian'-Shan'.

Vernyi, to my very great pleasure, appeared to me more attractive now than in 1856. All the little houses of the new fortification had been more or less completed, and a new garden had been planted around the house of the *pristav* of the Great Horde; here were the first trees planted at the foothills on which is the now blossoming garden city of Vernyi. The settlers had profitted from my advice not to transport timber to Vernyi immediately after its felling, but to let it dry beforehand in the forest zone, and complaints about the bad quality of local timber had ceased. Also at my previous year's insistence the Cossacks had managed to transport beehives to Vernyi from the Altai, and bee-keeping had started to develop little by little in Trans-Ili territory, to the surprise of the Kirgiz of the Great Horde, who told me that the Cossacks had contrived to import a fly which made sugar.

In the early spring of 1857 there also arrived in Vernyi new Russian peasant settlers, who, on the instructions of the *pristav* of the Great Horde, formed a later flourishing settlement by the river Talgar, twenty *versts* away from Vernyi. Satisfactory relations were very soon established between the new-comers and the aborigines of the Trans-Ili foothills (Kirgiz of the Great Horde); this was greatly assisted not only by the peaceful, agricultural character of the peasant-migrants, but also by the peculiarities of the orographical structure of the territory.

The entire Trans-Ili territory, which rises gradually from the riverside areas of the Ili at 300–350 metres to Talgar peak at 5,000 metres, according to my observations,<sup>1</sup> is divided by nature itself into five zones, like floors of a building, one above another.

The first and lowest of these zones is from 300 to 600 metres of absolute altitude; it is a fairly broad belt on both sides of the river Ili, and is characterized not only by its climate, with a very hot summer and a mild, comparatively warm winter, but also by totally Asiatic steppe flora and fauna, in which there are very few European forms: here the forms of Central Asian type prevail, in common with neighbouring Turkestan. Two-thirds of the plants collected on 11–13 May in this zone turned out to be typical Central Asian plants and only 20% of them were transitional either to the north-east to Siberia, or to the north-west to the Sarmatian plain, and somewhat more than that to the hot Aral-Caspian lowland. It is clear that this zone could not attract Russian colonization and remained almost entirely in the hands of nomadic aborigines, constituting one of the most important conditions of their existence for them, as here they have their winter camps, at which, with comparatively warm winters and a small quantity of falling snow, their herds find pasture for themselves during the whole winter.

<sup>1</sup> Modern measurements give the altitude of Talgar as 4,973 metres.

## SECOND JOURNEY TO THE TIAN'-SHAN'

The second zone lies at 600 to 1,410 metres of absolute altitude and is characterized by its moderate climate, both in winter and in summer, which is reminiscent of the climate of Little Russia [Ukraine], and also by its almost European-Russian flora, with a slight admixture of spring plants of Asiatic type.<sup>1</sup> This zone occupies the entire foothills of the Zailiiskii Alatau and is especially remarkable for its rich irrigation. Numerous streams which originate in the snows of the alpine zone encroach upon this agricultural, cultivated zone as full-scale rivers, abundant in water, and are broken up here into *aryki* (irrigation canals), fertilizing its arable lands and its plantations, and emerge into the lower zone as insignificant, small rivulets. It is clear that this zone became the main one for Russian colonization. The Russians, having learnt the methods of irrigation from the native inhabitants, were able to get fabulous crops on their arable lands without difficulty and to develop luxuriant orchards and vineyards. Although Russian colonization, having become firmly established almost exclusively in this zone, forced out the nomads, who had small arable lands here, which they lost, in return for that it afforded them such advantages in marketing the products of their cattle-rearing that they were easily able to buy from the Russians that small quantity of grain which was customarily used for food.

The third zone, forest, from 1,300 to 2,500 metres in absolute altitude, occupies the mountain slopes and valleys of the Zailiiskii Alatau, and is characterized by a rather severe and damp climate, but featured still quite rich woodland vegetation. The flora of this zone differs to a considerable extent from that of the previous one in that half of its species relate to local Central Asian plants and only the other half grow in Siberia and Europe or in the forest region, or in the alpine

<sup>1</sup> [Semenov:] In the course of my two weeks stay in Vernyi, during my excursions I studied particularly thoroughly the flora of this zone, the composition of which I found to include the following plants: *Chelidonium majus*, *Berberoa incana*, *Leptaleum filifolium*, *Sisymbrium junceum*, *S. loeselii*, *Stenophragma thalianum*, *Erysimum canescens*, *Capsella bursa-pastoris*, *Lepidium latifolium*, *Lepidium ruderalis*, *Helianthemum soongaricum*, *Gypsophila muralis*, *Lavatera thuringiaca*, *Althaea officinalis*, *Malva pusilla*, *Medicago falcata*, *Trifolium pratense*, *Tr. lupinaster*, *Tr. repens*, *Glycyrrhiza aspera*, *Lathyrus pisiiformis*, *Vicia lutea*, *Filipendula ulmaria*, *Agrimonia eupatoria*, *Potentilla supina*, *Daucus carota*, *Anthriscus silvestris*, *Asperula humifusa*, *Galium tenuissimum*, *Erigeron canadensis*, *Er. acris*, *Solidago virgo-aurea*, *Inula helenium*, *In. britannica*, *Xanthium strumarium*, *Bidens tripartita*, *Achillea millefolium*, *Artemisia oliveriana*, *Art. maritima*, *Art. vulgaris*, *Art. annua*, *Senecio praealtus*, *Cousinia platylepis*, *Cirsium lanceolatum*, *C. arvense*, *Cichorium intybus*, *Scorzonera austriaca*, *Heteracia szovitsi*, *Anagallis arvensis*, *Verbascum thapsus*, *Verb. blattaria*, *Scrophularia incisa*, *Veronica anagallis*, *V. beccabunga*, *V. biloba*, *Mentha silvestris*, *Lycopus exaltatus*, *Ziziphora clinopodioides*, *Rheum rhaponticum*, *Artraphaxis frutescens*, *Ixiolirion tataricum*, *Allium caeruleum*, *Eremurus altaicus*, *Erem. (Henningia) robustus*, *n. sp.*, *Cyperus fuscus*, *Elymus lanuginosus*, *Secale cereale*, *Agropyron orientale*, *Agr. repens*, *Bromus erectus*, *Eragrostis poaeoides*, *Phragmites communis*, *Milium effusum*, *Stipa capillata*, *Thleum paniculatum*, *Setaria italica*. In all in my list for the agricultural zone I give 78 species, of which not more than 10% are not present in Europe. These were chiefly bulbous plants of the early spring flora. Among them one splendid new species of the Liliaceae family was found by me for the first time; later it was named by Regel *Eremurus (Henningia) robustus n. sp.*

region.<sup>1</sup> Even before the establishment of Russian colonization it was of no benefit to the nomads, who always traversed it quickly, along the tracks which were most accessible for their herds, when they moved from their winter camps in the lower zone to the open pastures of their summer camps in the fourth, alpine, zone. For Russian immigrants, however, the forest zone was an indispensable aid to their settled colonization, as here they began to get all their building and timber materials, and also to organize their dispersed plots (*zaimki/khutora*) for bee-keeping and other purposes.

The fourth zone, sub-alpine and alpine pastures from 2,400 to 3,500 metres in elevation, occupies a large expanse in the Zailiiskii Alatau. This cold, alpine zone is an eldorado for the Kirgiz population, but quite unsuitable for Russian colonization, and hence remained wholly in the hands of the nomads, who only needed to be provided with free passage with their herds from their winter camps to this zone.

Finally, the fifth zone of the Trans-Ili territory begins at an altitude of 3,500 metres, and, being covered by perpetual snow, appears to be completely lifeless and in any case equally unsuitable either for Russian colonization or for the life of the nomads, and is attractive only to mountaineers and to scientific explorers. Nevertheless, it plays an important part in the natural economy of this blessed territory, since for all its apparent lifelessness it enlivens it with the help of the beneficial rays of the southern sun. The thawing of the snows of this zone not only directly feeds its meadows but also gives rise to wonderful mountain torrents, which, bursting into the agricultural zone in the form of full rivers, fertilizes its rich arable lands, orchards and vineyards there. In the agricultural zone these rivers disappear, not reaching the hot lower zone, and discharge, one may

<sup>1</sup> [Semenov:] Here is the list of plants collected by me in this zone in the valleys of the rivers Almatinka and Keskelen: *Atragene alpina*, *Ranunculus acris*, *R. lanuginosus*, *R. sceleratus*, *Berberis heteropoda*, *Draba incana*, *Hutchinsia procumbens*, *Helianthemum soongaricum*, *Viola biflora*, *Tunica stricta*, *Dianthus superbus*, *Cerastium davuricum*, *Linum perenne*, *Acer semenovi* n. sp., *Geranium rectum*, *Ger. divaricatum*, *Onobrychis pulchella*, *Prunus armeniaca*, *Potentilla pensylvanica*, *Pot. dealbata*, *Rubus caesius*, *Rosa platyacantha*, *Crataegus* sp., *Pyrus malus*, *Sorbus tianshanica* n. sp., *Epilobium roseum*, *Cotyledon semenovi* n. sp., *Ribes atropurpureum*, *Carum carvi*, *Seseli lessingianum*, *Pleurospermum anomalum*, *Lonicera tatarica*, *Echinops sphaerocephalus*, *Cousinia semenovi* n. sp., *C. umbrosa*, *Alfredia acantholepis*, *Mulgedium azureum*, *M. tataricum*, *Hieracium virosum*, *Pyrola secunda*, *Gentiana barbata*, *G. decumbens*, *Pedicularis verticillata*, *Polygonum polymorphum*, *Coeloglossum viride*, *Iris flavissima*. Among the plants collected in this zone, there turned out to be four types unknown until that time, namely: a species of maple, which forms beautiful small copses in the forest zone and was later named *Acer semenovi*; a special type of rowan-tree, which was described later by Academician Ruprecht\* under the name of *Sorbus tianshanica*; a beautiful plant with oily leaves from the family of Crassulaceae, named later *Umbilicus semenovi*; *Cotyledon (semenovia) semenovi*; and a Compositae plant, later named *Cousinia semenovi*.

\* Franz Johann (Ivanovich) Ruprecht (1814–70), German by nationality, was born and educated in Prague. In 1839 he migrated to Russia and worked in the St Petersburg Academy of Sciences until the end of his life, primarily as the keeper of its herbarium, becoming an Academician in 1853. On the basis of extensive travels in northern Russia in 1841 and the Caucasus in 1860–61, he produced fundamental studies of the flora of the Urals, northern Russia, Tian'-Shan', Kamchatka and Petersburg province, in addition to works on algae in the northern Pacific Ocean and the Sea of Okhotsk,



say, into the atmospheric ocean, again gathering as giants of the snow zone into the huge reserves of its perpetual snows.

In the composition of the local authorities in Vernyi I found a great change. Khomentovskii was no longer there. He had left his service in Siberia and gone to Petersburg. Apparently, his valour and enterprise weighed upon the Governor-general, who was particularly afraid of responsibility for any clashes between the too enterprising *pristav* of the Great Horde and the neighbouring Kokand khanate. Therefore G. I. Gasfort had appointed as *pristav* of the Great Horde a man who was undoubtedly honest and experienced in the service in Siberia, but who was very calm, sober-minded and less daring, and also less talented and less educated, than Khomentovskii. This new *pristav*, Colonel Peremyshl'skii, arrived in Siberia with Gasfort's predecessor, Governor-general Prince P. D. Gorchakov, whose illegitimate son he was, and from whom he received his surname of Peremyshl'skii, because the Gorchakovs traced their kin from the Princes of Peremyshl'. It was with this new *pristav* that I had to enter into an agreement with regard to my journey to the Tian'-Shan'.

Peremyshl'skii welcomed me very warmly and asked me to spend the duration of my stay in Vernyi at his wooden house, which was newly-built and the most beautiful house in Vernyi, having put up a luxurious *iurta* in his garden for my visit.<sup>1</sup>

Very soon I became friends with Peremyshl'skii, finding in him a man who was very simple, in the best sense of this word, decent to the highest degree, reasonable and possessed of great common sense. I explained to him that I had no aspirations at all to go west of Vernyi, to the river Chu or in general to the west of Issyk-kul', but that my only aim was to come out along the way already familiar to me, to the eastern extremity of Issyk-kul', to reach the northern slope of the snow ridge, enclosing the basin of the lake from the south, and to penetrate as far as possible into its valleys and into the mountain passes which join the Ili and Issyk-kul' basins with Kashgaria.

Peremyshl'skii reacted to my plan with total sympathy, and from consideration for my safety, agreed to give me an escort of fifty Cossacks and to help me hire eighteen camels from the Kirgiz for our packs. As it transpired, my journey served his purposes in the best way possible, as the position at Issyk-kul' now stood as follows. The war between the two Karakirgiz tribes controlling the Issyk-kul' basin was still in full swing. The Bogintsy, nominal subjects of China, having been ousted from the entire Issyk-kul' basin by the Sarybagish, Kokand subjects, were seeking to recover the eastern half of the Issyk-kul' basin which

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and geobotanical studies of the *chernozem* regions. An appreciation of his life and work by K. I. Maximovich was published in the Academy's *Zapiski*, T. 20, 1, 1871.

<sup>1</sup> Even in modern times some of the indigenous peoples of Central Asia, having adopted permanent urban house-styles, retain traditional *iurty* in their gardens. Nerazik and Zhilina, *Zhilishche*.

had belonged to them, and hence decided to enter into negotiations with the *pristav* of the Great Horde with a view to their acceptance as subjects of Russia, making this citizenship conditional on being given immediate protection from the enemies who were conquering them. With respect to the Karakirgiz, this was the beginning of the process through which the entire Kirgiz steppe passed, beginning with the Little Horde, taking up Russian citizenship clan after clan. Each clan which joined, by so doing, was delivered from raids by clans which had already become Russian subjects, and could fight victoriously against the next, still independent clan, as it felt itself to be under the protection and defence of Russia. Then the next clan, too, surrounded by possible enemies on all sides, in its turn had to seek safety by going over to Russian citizenship.

Peremyshl'skii with his simple common sense understood this position of the nomads who lived in his vicinity, and felt the inevitability of admitting the Bogintsy to become Russian subjects; on the other hand, he realized the necessity of rendering them assistance in whatever form at precisely this moment.

But Peremyshl'skii did not venture to undertake any military actions for this purpose from Vernyi with the troops entrusted to him, as undoubtedly Khomentovskii would have done, without the Governor-general's knowledge, and he thought it useless to solicit permission. Dealings with Petersburg would be involved, and the Ministry of Foreign Affairs, which was opposed to any conquests whatsoever by us in Central Asia, would have impeded the matter. Therefore, after thorough discussions with me, Peremyshl'skii settled on the following scheme. Understanding that the appearance of my convoy of fifty Cossacks on the Bogintsy's lands could not make the desired impression and satisfy the Bogintsy, he decided to instigate Tezek, the most enterprising and courageous among the sultans of the Great Horde, who was under his authority, in agreement with the Bogintsy and under the pretext of my expedition, to come to the aid of the Bogintsy with his irregulars, consisting, as it turned out later, of 1,500 horsemen. It goes without saying that Tezek agreed to Peremyshl'skii's solution with all the more pleasure since the Bogintsy had already turned to him for help and alliance.

My aim to penetrate at whatever cost into the heart of the Tian'-Shan' was ensured by such a scheme. It only remained for me to prepare for my journey, which required about a fortnight. That time was not lost by me for my work either; with Vernyi being only about twelve *versts* away from the entry into the Almatinka valley, I had the opportunity to make almost daily excursions there and by doing so was able to get thoroughly acquainted with the composition of the flora of all three zones of the foothills of the Zailiiskii Alatau.

In the second half of May on the mountain slopes nearest to Vernyi, there were still in flower early spring Asiatic forms, among which there was the strikingly beautiful plant with a tall stem up to three metres high, covered with pink flowers, that I have already mentioned. It belonged to the species of *Eremurus* of the

Liliaceae family and later received the name *Eremurus (Henningia) robustus*. Already from the very entrance into the valley there appeared typical shrubs of the lower forest zone: flowering barberry (*Berberis heteropoda*) and hawthorn (*Crataegus sp.*), *Atraphaxis frutescens* covered with pink flowers, and of herbaceous plants the beautiful peony (*Paeonia anomala*) and striking rhubarb (*Rheum rhaponticum*).

As we went deeper into the Almatinka valley, we wandered about a fascinating forest, which consisted of wild apple-trees and apricot-trees, covered with delicate pale pink blossom, and also of a species of maple, newly discovered by me, which was very similar to the Himalayan and Amur species, and which later received my name (*Acer semenowi*).

Going higher up the valley, we came into a zone of coniferous, pine forest, from which the inhabitants of Vernyi extracted their timber. At the onset of the forest zone I made a hypsometric measurement, which showed 1,370 metres of absolute altitude. Going still higher up the valley, after about three hours' journey we reached the upper limit of forest vegetation, which turned out to be at 2,540 metres according to my measurement. Here the zone of alpine meadows had already begun, where alpine plants were in flower: *Trollius dschungaricus n. sp.*, *Tr. altaicus*, *Callianthemum alatavicum n. sp.*, *Aconitum rotundifolium*, *Ac. napellus var. tianshanicum n. sp.*, *Viola altaica*, *Thermopsis alpina*, *Primula nivalis* and *Pleurogyne carinthiaca*.

Returning to Vernyi, on 23 May I made there one more hypsometric measurement, which showed 720 metres of absolute height.

By the end of May the camels were hired, and my expedition was finally equipped. On 29 May I left Vernyi at two o'clock in the afternoon with my whole detachment, which consisted of fifty-eight men, twelve camels and seventy horses. I travelled for twelve *versts* to a mountain spur, which stuck out into the Ili foothills like a promontory. Near the promontory at the small river Katurbulak, I came across many boulders of porphyry. Having travelled five *versts* from there, we crossed the river Bei-bulak, and after a further seven *versts* reached the beautiful river Talgar; we crossed it, travelled another four *versts* and stopped for the night at the foot of a second spur, which jutted out into the foothills.

Before it got dark, the artist Kosharov and I climbed up the top of this spur, and at sunset enjoyed a fascinating view of the snowy mountain group,<sup>1</sup> which after Talgar peak (Talgarnyn-tal-choku), seems to be the highest in the Zailiiskii Alatau. The sunlight, which had already set behind the other summits, was still flickering with its reddish brilliance on the pointed peak and the snow-white slopes descending from it. The Talgar peak itself was not visible behind this gigantic group of *belki*. When I was coming down a steep broad gully, I came across the den of a large wild animal, probably a bear.

<sup>1</sup> Kosharov no.126 (4).

The banks of the Talgar's tributary, by which we stopped for the night, were covered with meadow-sweet (*Spiraea hypericifolia*). That day I was able to find a plant, unknown to anyone yet, of the genus *Silene*; it was later called after me, *Silene semenowi* n. sp. The following interesting plants, already familiar to me, were collected at Talgar: *Papaver dubium*, *Hesperis matronalis*, *Erysimum cheiranthoides*, *Isatis tinctoria*, *Peganum harmala*, *Trigonella orthoceras*, *Sorbus tianshanica* n. sp., *Viburnum opulus*, *Valeriana officinalis*, *Filago arvensis*, *Dracocephalum integrifolium*, *Polygonum nodosum*, *Tulipa altaica*, *Eremurus altaicus* and *E. robustus*. Since the collection was carried out without leaving the cultivated zone, a significant percentage of the plants of the Talgar flora turned out to be common with the species of Europe. I did not encounter outcrops of solid rocks here. The foothills had argillaceous sandy soil and were rich in granite boulders. In the evening Colonel Peremyshl'skii and I agreed that the next day, having left my detachment, I would go on a mountain excursion for the whole day exploring the alpine Lake Dzhasyl-kul', Peremyshl'skii would go to the Kirgiz auly, and my detachment would move on to the next overnight stop at the river Issyk, and there we would meet the *pristav* in order to proceed together on 2 June to the gathering of the Kirgiz of the Great Horde.

On 30 May at nine o'clock in the morning the temperature was 14.3°C. I made arrangements for my detachment's move to the next camp at the place where the river Issyk came out to the foothills, and accompanied by the artist Kosharov, six Cossacks and two Kirgiz guides I made for the mountains to explore the alpine Lake Dzhasyl-kul'.<sup>1</sup>

We left our camp at six o'clock in the morning, making for the south at first, and then towards the east so as to cross the mountain spur, by which we had spent the night. We climbed along the rivulet which was flowing across the foothill valley. At the very beginning of our ascent Talgar peak could be seen clearly; it looked like Mont Blanc from here, but was even more picturesque and majestic. The valley up which we were going belonged by now to the forest zone and displayed a splendid profusion of apple-trees and apricot-trees, Tian'-Shan' rowan (*Sorbus tian shanica*), hawthorn (*Crataegus* sp.), Zailiiskii maple (*Acer semenowi*), *cherganak* (*Berberis heteropoda*), aspen, willow (*Salix viminalis*), honeysuckle (*Lonicera tatarica*) and *Atraphaxis spinosa*. Among herbaceous plants the following local flora were entered into my diary that day: *Aconitum pallidum*, *Paeonia anomala*, *Cardamine impatiens*, *Scabiosa caucasica*, *Erysimum cheiranthoides*, *Dictamnus albus*, *Valeriana officinalis*, *Rheum rhaponticum* and characteristic for local spring flora the bulbous plants *Fritillaria pallidiflora* and *Eremurus altaicus*. All these plants represented the typical lower forest zone.

The valley was like a luxuriant garden, populated at this time of year by the motley, smartly-attired migrants of the Dzhasik clan from the Dulat tribe of the

<sup>1</sup> Kosharov no. 138.

Great Kirgiz Horde. We stopped for a quarter of an hour and drank *airan* with them, and then their *biy* greeted us on the road with *kumys*. The valley was rising quite steeply, but soon we came out on to a gently sloping spur, which was cut through by a ravine; here we entered the spruce forest and came across the first outcrop of crystalline rocks, namely porphyry. At the spur we crossed the river Tal-bulak and from there began to go rapidly uphill. The mountain ridge which we were climbing was a spur of the main crest. Before us there rose a cupola-shaped porphyry knoll, entirely covered with spruce forest. Avoiding too steep an ascent, we began to skirt it, going up a steep gully, at the bottom of which unmelted snow could be seen here and there. The ascent was difficult.

The trees which featured in the middle orchard belt of the forest zone were rapidly disappearing in the following order: first, apricot-trees, then the apple, rowan, Zailiiskii maple, aspen, willow, and finally there remained only coniferous trees – spruce (*Picea schrenkiana*) and *archa* (*Juniperus pseudosabina*), and after them among the herbaceous vegetation there appeared typical representatives of the mountain alpine flora.<sup>1</sup> Under the thawing snows I was delighted to see the earliest spring flowers of our Russian Sarmatian plain: pale yellow flowers of coltsfoot (*Tussilago farfara*).

Having at last climbed the ridge which adjoined the cupola-shaped knoll, and having travelled a little along its western slope, we saw with delight at our feet 'the Green Lake' (Dzhasyl-kul'), which had the purest and the most transparent, rich bluish-green colour of trans-Baikal beryl. Beyond the lake there arose the bold and steep jagged crest of a high *belok*, and a little further to the right there unfolded a view of an even higher snow-capped mountain, which had the appearance of a dazzling white tent: our guide called this mountain Issyk-bash. Still further to the right, towards the south-west of the lake were visible the sharp peaks of a serrated granite crest, the slopes of which were also covered with snow, but only separate strips and patches of this snow remained by the end of the summer. Beside these peaks, which screened the view of Talgar peak, still slightly further to the right and closer to it there arose the cupola-shaped knoll, which was rockier on one side. We were here about 300 metres directly above the lake and were travelling along the crest to the south-west. Having crossed several of its undulations and ascending sharply, we reached the boundary of the forest.

<sup>1</sup> [Semenov:] In my diary for 30 May in the upper forest zone on the Issyk there are mentioned: Alpine clematis (*Atragene alpina*), four types of Anemone (*A. falconeri* var. *semenovi* n., *A. obtusiloba*, *Anemone narcissiflora*, *Pulsatilla albana*), four types of buttercup (*Ranunculus acris*, *R. polyanthemus*, *R. pulchellus*, *R. songoricus*), *Callianthemum alatavicum* n. sp., globe-flowers (*Trollius dschungaricus* n. sp.), *Isopyrum anemonoides*, *Delphinium speciosum*, *Aconitum pallidum*; of Papaveraceae: *Papaver alpinum* and *Glaucium squamigerum*; of *dymiankovii*: *Corydalis gortshakovii*; of Cruciferae: *Barbarea vulgaris*, *Arabis pendula*, *Cardamine impatiens*, *Thlaspi arvense*, *Thl. cochleariforme*, *Hutchinsia procumbens*, *Chorispora bungeana*, *Eutrema edwardsi*, *E. alpestre*, *Goldbachia laevigata*, *Parrya stenocarpa*, four types of *Draba* (*Dr. algida*, *Dr. altaica*, *Dr. hirta*, *Dr. incana*), *Taphrospermum altaicum*; of the saxifrage family: *Saxifraga sibirica*; and of bulbous plants: *Ixiolirion tataricum* and *Tulipa altaica*.

Dwarfish and gnarled trees were soon replaced by shrubs, among which *archa* (*Juniperus pseudosabina*) and a small species of honeysuckle (*Lonicera humilis*) predominated. The herbaceous flora were now high alpine.<sup>1</sup> Here I made a hypsometric measurement, which showed 2,500 metres of absolute altitude for the boundary of forest vegetation.

From here, leaving our horses with the three Cossacks, I began my ascent to the cupola-shaped knoll on foot. Our ascent was very difficult especially as half-way up we were shrouded in thick cloud and deafened by peals of thunder. But when at last we emerged from the thundercloud and reached the top of the knoll, the clouds all dispersed and the sun shone with all its brilliance. Only at our feet, above 'the Green lake', there were still black clouds, cloven by the brilliant lightning, while loud peals of thunder were repeated across the adjoining mountains. This magical spectacle of the mountain giants, lit up by the sun against a background of the cloudless sky above and of black lightning-streaked clouds above the 'Green Lake' beneath, will never be blotted out of my memory. At the very top of the knoll I made a hypsometric measurement, which gave 2,950 metres of absolute altitude. The temperature of the air between one and two o'clock in the afternoon was 8°C, with a fresh south-west wind. All of the northern side of our knoll was covered with masses of snow, partly newly-fallen.

During our rather long halt the clouds above the lake dispersed completely, and the entire landscape was revealed in its full brilliance. Dzhasyl-kul' was visible from this enormous height, just like Lake Brienz from the slopes of the Faulhorn;<sup>2</sup> only from the right side of the knoll, which I had measured, and which our Kirgiz guides called Kyz-imchek (Virgin's breast), the view of it was limited. A high wall of needles hid Talgar peak from us to a certain extent, and despite its steepness, was enveloped in a snow cover, from which protruded black teeth and needles, similar to the Aiguilles du Midi in the Mont Blanc<sup>3</sup> group, and absolutely inaccessible.

The Kyz-imchek knoll, on which we were standing, was the last and highest of the porphyry mountains, and further on from the beginning of the needles there were the granites, of which Issyk-bash and Talgar peak consisted. The needles appeared to me to be 500 metres higher than the Kyz-imchek knoll.

We were sorry to leave one of the most attractive landscapes in the Zailiiskii Alatau as we started descending to 'the Green Lake'. By approximately five

<sup>1</sup> [Semenov:] These are the plants collected by me on 30 May 1857, beyond the boundaries of the forest above Dzhasyl-kul': *Anemone narcissiflora*, *Trollius dshungaricus*, *Hegemone lilacina*, *Oxygraphis glacialis*, *Callianthemum alatavicum*, *Ranunculus altaicus*, *Ran. gelidus*, *Viola altaica*, *Saxifraga sibirica*, *Chrysosplenium nudicaule*, *Draba altaica*, *Dr. algida*, *Dr. lactea*, *Dr. sp.*, *Chorospora bungeana*, *Potentilla nivea*, *P. (Comarum) salessovi*, *Umbilicus platyphyllus*, *Hutchinsia procumbens*, *Lonicera humilis*, *Primula nivalis*, *Myosotis silvatica*, *Eritrichium villosum*, *Pedicularis versicolor*, *Tulipa altaica*, *Gagea liottardi*.

<sup>2</sup> This reference to the view of Lake Brienz from the slopes of the Faulhorn clearly derives from Semenov's visit to Switzerland in 1855.

<sup>3</sup> Aiguilles du Midi (3,845 m) in the Mont Blanc group, another recollection from his Swiss travels.

o'clock we reached our horses and, having mounted them, traversed the ridge, coming down it into the pine forest zone, and then entered the valley of a tributary of the Issyk, which was covered with woodland vegetation of the orchard sub-zone. On our way down we came across numerous *auly* of the Kirgiz and at seven o'clock in the evening we came out to the river Issyk, at which we found our whole detachment a little below the ruins of the first Russian winter camp of 1855. Here at half past seven in the evening the thermometer showed 15°C.

Before sunset Peremyshl'skii, the *pristav* of the Great horde, with whom I had arranged to go the next day to a gathering of two Kirgiz tribes of the Great horde (the Dulats and Atbans), at which an interesting legal dispute or legal proceedings between the two tribes was to be settled, arrived here too.

By Kirgiz customary law such a dispute was settled by the court of *biys* (Justices of the Peace), three from each tribe, in the presence of the senior sultans of both tribes and the *pristav* of the Great Horde. Moreover, the *biys*, following the same customary law, should choose as chairman or super-arbiter a person who was extraneous to both tribes and completely impartial. The *biys* unanimously recognized me as such a person, being a man who had come from afar, did not belong to the local administration and had the reputation of being 'a learned man', who after his last year's travels in the Trans-Ili territory already enjoyed popularity with the Kirgiz of the Great Horde. The *pristav*, who was very much afraid that, because of this dispute, intestinal strife would arise between tribes subject to his jurisdiction, was particularly pleased to endorse the choice of the *biys*, and I agreed with pleasure to take an active part in the matter. This at once introduced me not only to the persons who had the fate of the whole Horde in their hands, but also to local Kirgiz customary law and to their philosophy, which had survived intact in the Great Horde, which even in the middle of the nineteenth century, that is, until the occupation of the Trans-Ili territory, still enjoyed much independence and fought against its neighbours and enemies without the assistance of the Russian administration. In consequence of this, during my travels among the Great Horde it was possible to meet many old heroic and, one may say, Homeric types.

On 31 May at dawn a bad storm fell upon our bivouac, and twice tore away my tent and several Kirgiz *iurty*, including the *iurta* of the *pristav* of the Great Horde. An enormous cloud, which we had already seen the previous day at sunset, struck us at six o'clock in the morning and burst in thunder-claps and pelting rain. However, the rain stopped by eleven o'clock, with the temperature at 11.4°C, and between one and two o'clock in the afternoon the weather cleared up completely, and Colonel Peremyshl'skii and I were able to leave for the gathering which was expecting us. I sent my whole detachment without haste to the next stop suggested by me at the river Turgen, while I joined Peremyshl'skii with only a small escort in order to make our way with him to the Kirgiz *auly*.

The case due for hearing by the gathering, was as follows. The daughter of a distinguished Kirgiz, by name Beiserke, from the tribe of Dulats, was promised

in marriage to the son of a no less distinguished Kirgiz from the tribe of Atbans. The groom's parents had already paid the bride-money in full, and the young man had the right to take his bride as a wife. But what was the universal surprise when, on his arrival to become acquainted with her, she took a great dislike to him and resolutely declared that she did not want to be his wife, and to her parents' pleadings she replied that, of course, they could take her by force, but he would in no circumstances get her alive. Knowing the character of the young girl, her parents did not doubt that she would not go back on her decision, which was an almost unprecedented violation of customary law. Nevertheless, they began to feel sorry for their beloved daughter, and they ardently sided with her, declaring that they were ready for any sacrifices for her ransom and rescue, and that they themselves would not give her up. The beauty of Beiserke's daughter, her independent mind and courage attracted to her side not only her whole clan but also the whole tribe, and if the groom had belonged to this tribe, the matter might have been settled, as it might have been possible to persuade the groom and his parents to give up his bride in return for the bride-money and a large sum in compensation. But since the groom did not belong to the same tribe as the bride, the whole tribe of the Atbans considered the incident a public insult and raised all their old scores of many years, which were also intensified by personal animosity between the sultans of the two tribes.

A very spacious *iurta*, richly decorated with Bukharan carpets, was set out for the gathering. In front of it we were greeted by the senior sultans of the two tribes. They were, on one side, Tezek,<sup>1</sup> Sultan of the Atbans, who was famous throughout Semirech'e for his wit and courage, and very popular throughout the entire Kirgiz steppe, and on the other side, Ali,<sup>2</sup> the somewhat arrogant old Sultan of the Dulats, very famous for his wealth and hospitality.

The *pristav* introduced both sultans to me, and when we came inside the *iurta*, I was greeted by the *biys*, who had chosen me to be their super-arbiter. I was greatly interested in the personalities of these *biys*, especially as I did not see in them hereditary dignitaries, but elected representatives of the people. However, it transpired that in the middle of the nineteenth century no-one either elected or appointed *biys*. They were simply identified by public opinion as people to whom all those in need of justice turned of their own free will to settle disputes, people who were experienced and who had secured a universal reputation by their fairness, intellect and other qualities, but especially by their intimate knowledge of popular customary law. Among such persons there were both noble people of blue blood, and also quite often common people, but in any case individuals who were renowned for their indubitable personal virtues. The residences (nomad encampments) of these people were known to everyone, and the

<sup>1</sup> Kosharov nos. 13 and 44.

<sup>2</sup> Kosharov nos. 17 and 26.



more fame they enjoyed, the more clients they had. To our gathering *biys* of both sides were summoned by the sultans, who were guided exclusively by public opinion in their choice.

On the Dulats' side there was Dikambai, the bride's uncle, a man of athletic build, who possessed a thunderous voice, a famous *batyr* (hero), who in battles broke lances directed at him ten at a time. The second representative of the Dulats was Dugambai, a venerable old man with a long grey beard, who enjoyed a reputation as the best expert on and true repository of Kirgiz customary law. The third representative of the Dulats was Dzhainak,<sup>1</sup> a lively man, always witty and apt in his remarks.

Among the Atbans, another Dzhainak<sup>2</sup> was considered the best expert in customary law, but the second representative, Atamkul,<sup>3</sup> who was famous for his fairness and integrity, and was said to be the best *batyr* of his tribe, enjoyed the greatest respect. Valorous on the battle-field, dexterous at *baiga* (tournaments), he was no less wise at the councils and at public hearings and personified the type of 'chevalier sans peur et sans reproche'.<sup>4</sup> Finally, the third representative of the Atbans, Mamai, was also one of the bravest people of his tribe, famous for his enterprise, courage and skill at *baranty* (raids) and had all the inclinations of an energetic expropriator.

At the rear of the *iurta*, in the highest place of honour there was spread a rich Turcoman carpet, on which I was placed next to Colonel Peremyshl'skii, while an interpreter took his place in an unobtrusive spot behind us. To my right Sultan Tezek, who had been designated as my ally in the expedition which I was to undertake to the foothills and into the heart of the 'Tian'-Shan', took his place, and to the left of Peremyshl'skii the 'Agamemnon' of the Great Horde who did not want to permit the forcible abduction of 'the beautiful Helen'<sup>5</sup> from his tribe. Further away on either side of our central group the majestic figures of the six *biys* disposed themselves on separate small carpets.

The hearing began with the nobleman Beiserke bringing into our *iurta* his daughter as defendant, summoned to the court at my request. Beiserke's daughter, an elegant nineteen-year-old girl, impressed all those present with her beauty and unusual animation. With a loud voice and great energy she delivered the speech for her defence, in which she explained that she fully recognized the right to her of the groom, his parents and the whole tribe of the Atbans, and that the

<sup>1</sup> Kosharov no. 42.

<sup>2</sup> Kosharov nos. 9 and 45.

<sup>3</sup> Kosharov nos. 9 and 45.

<sup>4</sup> Semenov's phrase is a Russian version of the description given to Pierre du Terrail (1476–1524), chevalier de Bayard, who served Louis XII and François I in their campaigns against Milan and Naples and whose behaviour came to epitomize medieval European chivalry: *Nouvelle biographie universelle*, Paris, 1852, 3–4, pp. 856–63; *Grand Larousse encyclopédique*, Paris, 1960, 2, p. 6.

<sup>5</sup> The allusion here is, of course, to the Trojan wars.

court, probably, would not decide in her favour, but that on no account would she pass to her husband alive, and that there was no benefit either for the groom or for his parents to obtain her dead.

After her, I also addressed the *biys*, my speech being immediately translated into Kirgiz, expressing the view that, of course, the matter must be tried in accordance with Kirgiz laws, which were known to the *biys* better than to me, but that I could not help reminding them that according to Russian law it was not allowed to force a girl to enter marriage without her consent to it, and therefore there ought to be found such a way out of this matter, which, while satisfying Kirgiz laws, would not have as a consequence the pointless death of a girl who had spoken so resolutely before everyone. However, in this case I recognized two important conditions: the first was just satisfaction of the interests of the groom and his parents, and the second was the satisfaction of the honour of the whole tribe. As for the first, I knew that the *biys*, as Justices of the Peace, would first and foremost seek a reconciliation between both parties, and I was sure that they would find the means towards such a reconciliation, observing the interests of the plaintiffs and justice. Regarding the second, both tribes were perfectly well represented here both by the *biys*, who enjoyed the people's trust and by their sultans, therefore it was possible to hope that the gathering would find it possible to get out of the difficulty with the full satisfaction of the honour of both tribes.

After this intervention the *biys* began to discuss the matter of substance. Soon an argument started among them, quite calm at first, and then more and more passionate and all but turning into an open quarrel. All three Atban *biys* argued heatedly that the bride's refusal, supported by her parents, constituted an unprecedented infringement of the law, which was an insult to the whole tribe.

In response, for the Dulats, Dzhainak got up and, with his universally recognized authority, began to argue that even if it was indeed an undoubted infringement of the law on the part of the bride and her parents, an infringement of law had also occurred earlier on the groom's part. According to Kirgiz custom, a daughter of a nobleman could only be the first wife of her husband, and parents of blue blood would never agree to give their daughter in marriage to be a second wife. The parents, in concluding a marriage deal for their daughter, knew that her groom was not married and that they were receiving the first bride-money from him and giving their daughter to be the first wife. But when the bride-money had been paid, and the groom came to take his wife, it turned out that he was already married. Two Atban *biys* denied this fact, but the third, the fair and irreproachable Atamkul, explained this contradiction, saying that the groom indeed already had a wife, taken after the payment of the bride-money for Beiserke's daughter and before taking her as a wife; however, the groom did not pay any bride-money to anyone else and personally had had no intention of entering into a marriage with another bride, but had to acknowledge as his wife the widow of his brother, which was not only his right, but also his duty. The matter

became greatly complicated by this explanation. After rather prolonged arguments, however, Atamkul admitted that on the part of the groom there had occurred an infringement of the rights of the bride, albeit unintentional, and therefore all the *biys* agreed to enter into negotiations with the groom's parents about their satisfaction. After these negotiations the *biys* managed to persuade the groom and his parents to relinquish the bride themselves, having received back their bride-money, and moreover also a *kun* (a ransom for a bride already belonging to them) at an amount equal to the bride-money.

There still remained the second question: how could the honour of the Atbans be satisfied? *Bi*y Mamai got up and suggested the following scheme: the bride should be handed over to the groom, at least for one week, and then at his own volition he would relinquish her and send her back to her parents.

I raised an objection to this, saying that I thought it was quite sufficient that Beiserke's daughter had been brought on our summons to the court by her parents, who in so doing had already expressed their obedience to the decision of the gathering, but that handing her over for one week would now be totally incompatible with the dignity of a girl of blue blood, who could only become for ever the first wife of her husband, but on no account could she be his temporary concubine. The *pristav* supported me energetically, declaring that in a tribal dispute he could not let the restoration of the rights of one tribe be conjoined with an even greater infringement of the rights of the other.

Cunning Sultan Tezek rose. He explained that he did not think he had the right to interfere in the hearing of the *biys* when they were discussing the rights of the two litigant parties, that is of the groom and the bride, but when it was a matter of the restoration of the precious honour of the whole tribe, which he governed, he thought it was his duty to express his opinion. He thought it was justified to recompense the groom and his parents by returning the bride-money and payment of the *kun*, but irrespective of this, in order to satisfy tribal honour, he proposed refusing Dikambai, the bride's uncle, who was present there, the bride with whom he had arranged a marriage in the Atban tribe, with the return of his bride-money, of course, but without payment of the forfeit (*kun*). The proposal was accepted unanimously by the *biys*, but with the proviso that Dikambai's consent to it be forth-coming. Dikambai got up and declared that, wishing to save his niece and to restore peace between the two tribes, he agreed to the *biys'* proposal. The matter was unanimously settled by the gathering. Dikambai was paid fifty horses, and the Atban groom and his family 100 horses. Thus the dispute, which had gone on for more than a year, ended to everybody's delight, and the bride's young brother, Khodzhir, was sent to her and her parents at the *auly* of Sultan Ali as an envoy to bring the good news.

The *biys* departed. Tezek set off round the *auly* to gather his Atbans in order to follow me on the expedition to the aid of old Burambai; and together with Pere-myshl'skii I went to the place of our overnight halt, which had been prepared for

us at Tal-bulak, a few *versts* away from the venue of our gathering. From there I let my detachment at the river Turgen know that the next day (1 June), without waiting for me, it should make its way (as I meant them to do) from their overnight stop at the river Turgen to the next halt at the river Kara-turuk, as Colonel Peremyshl'skii and I had accepted the invitation of Sultan Ali to the *auly* of his son Ables, who had a nomad camp at the river Turgen, at this river's exit from the mountain valley, a little further up from the camp of my detachment.

It was raining during the night of 1 June at Tal-bulak, and the morning was overcast. We left no earlier than seven o'clock in the morning and in a few hours reached the *auly* of Ables.<sup>1</sup>

The *iurta* which was erected for us consisted of felt, beautifully embroidered with braid and was sumptuously decorated with Bukharan carpets. But I was much more interested in Ables's permanently inhabited *iurta*,<sup>2</sup> into which we were invited for refreshments, and where I could familiarize myself with all the household articles of wealthy Kirgiz of the Great Horde, and with hand-made articles, for example, their snow-white felts of camel's hair, embroidered with coloured cords and trimmed with a wide variegated ribbon, and also beautiful multi-coloured felt carpets, sewn together like a mosaic of coloured felts, and so on. We could justifiably wonder at both the spaciousness and comfort of this living *iurta*, and at the richness of its decor with high quality Bukharan, Kashgar and Turkmen carpets,<sup>3</sup> and at the diversity of the household articles, partly of Oriental, partly of Russian manufacture, arranged on the carpet bales along the walls of the *iurta*. Among these articles there were Chinese porcelain tea-cups and Russian glasses and small saucers, Russian knives and forks, silver spoons, beautifully shaped Bukharan copper *kumgany* (wash-hand-stands and wash-tubs), Russian wooden platters, large bowls which substituted for dishes, and numerous Russian caskets and boxes. On one side of the *iurta* there was a divan-bed, covered with rich quilts, made of motley silk materials in mosaic pattern. Beautifully embroidered with many-coloured silks, cloth napkins covered the carpet bales, which were beautifully tied together with home-made cords and arranged along the walls.

In front of the divan-bed on the carpet Ables's wife was sitting, dressed in a rich Chinese robe (*khalat*). On her head was a white, picturesquely folded head-dress. But when Sultan Ali came into the *iurta*, a rich silk curtain came down in front of the part of the *iurta* where Ables's wife was sitting and hid her, as she was not supposed to show herself before her father-in-law.

The meal began. At first *kumys* was served, then tea in Chinese cups with sugar, raisins, dried peaches and apricots, wheaten rusks made with butter, and Tashkent sweets. Then the feast continued with a very tasty *pilau* made with

<sup>1</sup> Kosharov no.3.

<sup>2</sup> Kosharov nos. 132, 22 and 39.

<sup>3</sup> For Bukharan, Kashgar and Turkmen carpets, see Tzareva, *Rugs and Carpets, passim*.

sheep's-tail dripping, mutton, raisins and onions. Ables's little son came out and his two little sisters appeared for a moment; the latter were dressed in little silk oriental robes and Kirgiz *sharovary* [wide trousers], with fur hats on their heads.

After that we returned to our *iurta*, where we were escorted by Ables; he was richly dressed in a *khalat*, embroidered with gold, and wore a conical velvet hat, also embroidered with gold and trimmed with sable. Here more food was served, consisting of mutton and horse-meat.

At about one o'clock in the afternoon I took leave of my hospitable hosts and with Colonel Peremyshl'skii set off at a gallop to catch up my detachment. We crossed the Turgen opposite three *kurgans*, quickly traversed the foothill plain, which was intersected by deep ravines and hollows. Twelve *vershs* from the Turgen we crossed the river Cherganak and, having travelled another eight *vershs*, joined our detachment. With it we travelled a further ten *vershs*, reached the river Kara-turuk, and it was there that we settled for the night at the river's exit from the mountain valley.

The river Kara-turuk made a disagreeable impression on us with the dark, dirty colour of its water, from which its name originated. This colour resulted from the weathering of argillaceous porphyry, outcrops of which existed at the beginning of the gorge, not far from our camp. The soil at the river's exit from the mountains consisted of fertile deposits, while further down the river good meadows and pastures were to be found, but the hills nearest to the river had sandy and clayey soil, not particularly fertile and partly covered with shrubs of sweetbrier and *Sophora alopecuroides*. Of the grasses there were striking steppe forms of astragal (for example, *Astragalus schrenkianus*). From the nearest of these foothills at sunset there was a good view of the mountains to the east of the Ili: Altyn-emel', Alaman and Katu. The mountains to the south of us, which had been covered with fog on our arrival at the camp, cleared towards the evening, and there was visible fresh snow, which had fallen on them in large quantities during June.

The night of 2 June was cold, but by seven o'clock in the morning the temperature had risen to 12.2°C. We moved off from our bivouac at 10 o'clock in the morning and went along the foothills straight to the east along the foot of the lower continuation of the northern chain of the Zailiiskii Alatau. The soil on our way was at first sandy and barren, then clayey and quite fertile. Since all the thirty *vershs* which we covered on 2 June between the Kara-turuk and the Chilik, though having a steppe character, lay entirely in the second, that is, cultivated zone, and were very convenient for the construction of irrigation ditches; quite extensive Atban arable lands were located there. The vegetation of this foothill steppe, in which the flora typical of the cultivated zone of the Zailiiskii Alatau had a considerable admixture of Asiatic-type flora of the lower steppe zone of the Trans-Ili territory, seemed from its ashy colour as if it was scorched by the sun. Although my collection on 2 June was not the most interesting, nevertheless that

day I managed to find a new hitherto unknown Compositae plant of the species *Cousinia*, which later received my name (*Cousinia semenovi* n. sp.).<sup>1</sup>

The intrusion of steppe plants into the cultivated zone was especially noticeable about ten *versts* from the Chilik, where the hitherto continuous northern chain of the snowy Zailiiskii Alatau came abruptly to an end, continuing, however, still further in a lower crest, which did not reach the snowline. The mountain which made up the extremity of the snowy chain was called by the Kirgiz Bokaibiik, that is, 'the abruptly falling mountain'. Further to the east of it, across the transverse gorges of the lower chain and at a short distance from each other, there break away into the foothills two rivers which originate in the alpine zone of the Zailiiskii Alatau, where they flow in valleys parallel to each other. These rivers, the Asy-su and the much bigger Chilik, merge at their exit from the mountain gorges into the foothills. The Asy-su, the smaller of them, was diverted into *aryki* for irrigating the Atban arable lands to such an extent that it reached the incomparably fuller Chilik as a completely dry river-bed, strewn with huge boulders of porphyry and syenite. Across this river bed we made our way with difficulty to the course of the Chilik,<sup>2</sup> which with unusual speed rolled its noisy waves over huge rocks, which it had brought from the interior of the Zailiiskii Alatau.

At three o'clock in the afternoon we stopped on the left bank of the Chilik at its confluence with the Asy-su, which was dry at that time of year. Here, there was erected for me a spacious Atban *iurta*, which met a pressing need, as a black cloud, which had come down from the mountains, fell upon us very soon, and it began pouring with rain; and meanwhile the master of the local foothills, Sultan Tezek, with whom I had already become acquainted at the Atban-Dulat gathering, had arrived for an essential meeting. During three hours, under the protection of the durable *iurta*, despite the bad weather, we were finally able to discuss our forthcoming expedition in comfort, over a cup of tea offered to my guest, and having allocated our roles in rendering assistance to Burambai, the old Bogintsy *manap*, to arrange a place for our rendezvous in front of Burambai's nomad camps near the mountain pass at Santash, the foot of the Tian'-Shan' range.

On closer acquaintance with Tezek, who was famed as a hero throughout the

<sup>1</sup> [Semenov:] In my diary for 2 June 1857, the following plants were noted as found on the foothill steppe between the Kara-turuk and the Chilik: *Papaver pavoninum*, *Sisymbrium sophia*, *Sis. brassicaeforme*, *Erysimum canescens*, *Capsella bursa-pastoris*, *Euclidium syriacum*, *Dianthus crinitus*, *Lavatera thuringiaca*, *Peganum harmala*, *Ruta sieversii*, *Hypericum perforatum*, *Sophora alopecuroides*, *Medicago lupulina*, *Trigonella polycerata*, *Astragalus schrenkianus*, *Rosa cinnamomea*, *Rosa laxa*, *Spiraea hypericifolia*, *Potentilla bifurca*, *Umbilicus platyphyllus*, *Carum setaceum*, *Galium verticillatum*, several types of wormwood (*Artemisia scoparia*, *Art. oliveriana*, *Art. maritima*, *Art. sacrorum*, *Art. vulgaris*, *Art. annua*), *Cousinia affinis*, *Cous. semenovi* n. sp., *Filago arvensis*, *Cichorium intybus*, *Taraxacum* sp., *Tragopogon pratensis*, *Scorzonera* sp., *Cynoglossum viridiflorum*, *Verbascum thapsus*, *Verb. blattaria*, *Orobanche amoena*, *Plantago lanceolata*, *Chenopodium botrys*, *Orchis turkestanica*, *Allium caeruleum*, *Trilicium aegylops*, *Poa bulbosa*, *Agropyron prostratum*, *Agr. cristatum*.

<sup>2</sup> Kosharov no. 109.

whole Great Horde, I became convinced that I was indeed dealing with an outstanding personality. Tezek was little more than forty years old; he was tall, with the open countenance of an aristocratic Kirgiz type, and the refined manners of a man of blue blood, but had far from an athletic build. He was even born prematurely, and hence received the name of Tezek (which meant 'litter' in Kirgiz). But his origin,<sup>1</sup> his innate talent, and favourable circumstances during his youth had made of him an outstanding personality.

These circumstances consisted of the fact that the Great Kirgiz Horde, which acquired Russian citizenship after all the others, and led a nomadic life in the most remote outlying districts of Russian domains in the Kirgiz steppe, enjoyed considerable independence before the colonization of the Trans-Ili territory, that is before the second half of the nineteenth century. It did not have any close or immediate Russian authorities, like the *pristav* of the Great Horde which was established later, but was subordinate only to the Semipalatinsk governor, who lived in his regional centre on the Siberian Cossack line, which passed along the Irtysh far behind the Kirgiz steppes at a distance of a thousand *verssts* from the lands of the Great Horde. The latter occupied an extensive area in the southern part of Semirech'e up to the Chinese borders of Kul'dzha region and in Trans-Ili territory as far as the southern chain of the Zailiiskii Alatau, which separated them from the lands of the Karakirgiz, who were partly nominal dependents of China, but primarily subjects of the Kokand khan. It was with these wild rapacious mountain-dwellers that about the middle of the nineteenth century the Kirgiz of the Great Horde had to struggle for existence, that being especially hard as there was not a single Russian settlement on their lands until 1854, and the nearest Russian stronghold to them was the town of Kopal, which had settled and stable Russian colonization only from 1859. But even this outpost of the Russian empire did not give our nomadic subjects an appropriate strong point against their foreign enemies, since the local authorities in Kopal were afraid, not so much of the Karakirgiz, as of their appalling responsibility before the Petersburg authorities for instigating international conflicts. Therefore, it remained to the Kirgiz of the Great Horde, who were continually exposed to the raids and *baranty* of their rapacious foreign neighbours, to seek salvation in courageous and energetic self-defence. These conditions of independent struggle for existence cultivated among them in the middle of the nineteenth century courageous and heroic types, among whom were the pledged associates of my undertaking, namely Sultan Tezek and *Biy* Atamkul.

<sup>1</sup> [Semenov:] The Atban and Dulat tribes of the Great Horde still retained a common name of *usun* in the middle of the nineteenth century. Their sultans considered their clan to have originated from more ancient rulers than the Chinghiskhanids, the forefathers of many sultan families of the Middle Horde; it is quite possible that the sultans of the tribes which preserved the name *usun* originated from the ancient *usun* rulers (*kun-mi*), with whom the Chinese dynasty had become connected as far back as the second century BC.

Having become thoroughly acquainted with Tezek, I soon arrived at the conclusion that with such an ally I could at last fulfil my cherished dream to pave the way into the heart of Central Asia from the Russian side, into the depths of the most central of the mountain systems of the Asian continent, the Tian'-Shan', which until then had been totally inaccessible to geographical science.

My rapprochement with Tezek happened especially quickly, because, with his characteristic precision of mind he understood where his role began and where it ended, and he found it beneficial to put himself with all his horsemen at my full disposal for the duration of my stay in Burambai's domains, knowing, from my already established reputation, that I did not permit any extortions from the Kirgiz, that I would not take any presents from the Bogintsy, who had come under our protection, and that all Burambai's gratitude for the assistance rendered would fall to Tezek's lot. It remained only to arrange the time and place of our meeting in front of Burambai's encampments.

Before the evening came, when the weather cleared, I had already parted with Tezek, and from five o'clock in the afternoon settled to my scientific work, a survey of the environs and hypsometric determination of the absolute altitude of our camp. The latter (at the confluence of the Asy and Chilik) turned out to be 880 metres. At six o'clock in the evening the air temperature was 14.1°C. The vegetation in the valley at the place where the river Chilik emerged from the mountains was very rich. The marvellous greenery of the trees and flowering grasses seemed to be a dark emerald oasis amidst the grey desert of the surrounding foothills, where the steppe vegetation came out even higher than the valley from which the Chilik flowed. The arboreal vegetation consisted of Siberian poplars (*Populus nigra* and *P. suaveolens*), Zailiiskii maple (*Acer semenovi*), four types of willow (*Salix songorica*, *S. alba*, *S. purpurea* and *S. viminalis*), *boiarĕa* (*Crataegus* sp.), sea buckthorn (*Hippophae rhamnoides*), and *cherganak* (*Berberis heteropoda*). All these trees and shrubs were intertwined with Dzhungarian clematis (*Clematis songarica*). Of the grasses collected by me that day on the lower course of the Chilik, the following types were entered in my diary: *Ranunculus acris*, *Cynoglossum viridiflorum*, *Orchis turcestanica*, *Carex punctata*, *Elymus junceus*, *Agropyron cristatum*.

On 3 June, with clear weather, at seven o'clock in the morning the thermometer showed 15.5°C. First of all we tried to orientate ourselves in the surrounding area for the continuation of our journey. The mountains of the foothill zone between the Asy and the Chilik were called Saushkan by our guides, while the more remote crest, which divided the longitudinal valleys of the Chilik before they came out from the mountains, was called Ortotau. The lower continuation of the northern chain of the Zailiiskii Alatau was called by them Seirek-tash, and its further extension was called Boguty, but through the gorge carved by the Chilik there was visible the chain of Turaigyr, which was even more northerly



and parallel to Seirek-tash and Boguty, and higher. None of these chains reached the snowline.

Our further route lay through two passes: Seirek-tash and Turaigyr, as a possible track through the Chilik gorge was reckoned to be absolutely inaccessible at that time for our numerous detachment and especially for the camels.

We moved off from our camp at eight o'clock in the morning and immediately crossed the noisy, stormy and foaming Chilik by a ford found by our Kirgiz; however, crossing the Chilik at the beginning of June, when in the alpine zone the biggest thaw had not started, did not present a great danger. A few *verst*s beyond the ford we already began going steeply up the mountain pass of the considerably lower, northern, chain of the Zailiiskii Alatau. All this lower chain appeared to be totally treeless on its slopes, and only the valley across which we were climbing, enlivened by the flow of a rivulet, was picturesquely edged by a whole row of light-green, spreading maple-trees. Higher up the valley turned into a rocky gorge, which consisted of siliceous schists extending from north-east to south-west at  $65^\circ$  with a dip of  $80^\circ$  to the north. The stratification of this siliceous schist was particularly clear along its contact with the porphyry, which raised its strata. Further our road now went through a narrow porphyry gorge, which was overgrown with shrubs: *argai* (*Cotoneaster racemiflora*), hawthorn (*Crataegus* sp.), which was covered with white flowers, currants (*Ribes heterotrichum*), honeysuckle (*Lonicera microphylla*) and beautiful sweetbriers (*Rosa platyacantha* and *R. cinnamomea*).

At last we came out on the ridge itself, which was covered solely with herbaceous meadow vegetation, which, however, had neither an alpine nor sub-alpine character. To our right there was Seirek-tash, that is the overhanging rock, from which the whole mountain pass took its name. At the top, near the very peak, we came upon a small spring, flowing to its northern side and having a temperature of  $4.8^\circ$ , with an air temperature of  $16.5^\circ\text{C}$  and a light easterly wind. Here I took a hypsometric observation, which gave 1,560 metres for the crest of the mountain pass.

From this peak to the north there was a very good view of the Ili valley. Beyond the river Ili at first sand hills rose, then the pseudo-volcanic hills of Katu and the mountains of Kalkan, which were right on the Chinese border, and on the northern horizon the snowy chain of Alaman, which was part of the Semirechensk Alatau, the higher extension of which within China was lost in fog. During my traverse across Seirek-tash on 3 June I managed to discover two new, hitherto unknown, Compositae plants of the genus of camomile (*Chrysanthemum*), later named *Chrysanthemum* (*Pyrethrum*, initially *Tanacetum*) *alatavicum* n. sp. and *Chr.* (*Pyrethrum*) *semenovi* n. sp. I also collected the following plants: *Helianthemum soongaricum*, *Dianthus crinitus*, *Caragana aurantiaca*, *Potentilla multifida*, *Rosa laxa*, *Cotoneaster racemiflora*, *Umbilicus platyphyllus*, *Ribes heterotrichum*, *Patrinia intermedia*, *Convolvulus gortshakovi*, *Conv. pseudocantabrica*,

*Scutellaria orientalis*, *Lagochilus diacantophyllus*, *Ceratocarpus arenarius*, *Salsola arbuscula*, *Thesium multicaule*, *Euphorbia alata*, *Ephedra* sp.

From the pass at Seirek-tash we descended across a transverse porphyry gorge to the dry, waterless and rather barren plateau which separates the parallel mountain ridges, Seirek-tash and Turaigyr. The outcrops of solid rock which we met consisted of siliceous schists with an orientation from north-east to south-west at 70° and a dip of 40° to the south-east. The schist was metamorphosed by the porphyry, which cut across it, and small hills of which appeared at the end of a slope. As these hills changed into a plateau, the soil became dry and barren, and in the herbaceous flora there predominated thorny plants, for example, *Acanthophyllum pungens*, thorny and non-climbing *Convolvulus* (*Conv. gortshakovi* and *Conv. subsericeus*), and thorny *Eremostachys* sp. The soil of the intermontane plain to which we had descended was sandy clay, covered with pebbles and fragments of porphyry and siliceous schist. Here and there on it there were found *solontsy*, that is white coatings of salt on dried mud.

Having at last come upon a spring to the left of our path, we halted for an overnight stop. A hypsometric measurement showed the altitude of the plateau here as 1,120 metres. At three o'clock in the afternoon the Celsius thermometer showed 18°. Ahead of us there arose Turaigyr, which differed from Seirek-tash only by the fact that its entire northern slope was covered with spruce forest. Across the gorge carved through it by the Chilik, a view appeared of the southern chain of the Zailiiskii Alatau, which consisted of a continuous row of snow *belki*.

On 4 June, after a night storm and heavy rain, the weather cleared and at eight o'clock in the morning the Celsius thermometer showed 12.5°. At that hour we set off on our journey and took about an hour and a half to cross the flat plateau on which we had spent the night to the foot of Turaigyr. The plain was absolutely barren and all strewn with pebbles and fragments of red and dioritic porphyry and *rogovik*,<sup>1</sup> which became bigger and bigger as we drew near the foot of the ridge. The colour of the rocky desert was grey, there was almost no vegetation on it, and only twice we came upon circular patches of ground, on which grew the steppe plant *harmala* (*Peganum harmala*). Turaigyr was rising steeply before us, stretching straight from west to east. Its entire northern slope, beginning from the Chilik's breach through it, was covered with spruce forest. The highest peak of the ridge, seemed to be twice the height of the pass over which we had to proceed. At the beginning of the ascent of this pass we came upon outcrops of siliceous schist, black lidite [chalcedony]<sup>2</sup> and breccia, and finally clearly bedded conglomerate with an orientation from the north 80° 20' towards the east-south-

<sup>1</sup> Hornblende, *B&E*, 28, pp. 861-2.

<sup>2</sup> Lidite, *B&E*, 73, pp. 24-5.

east and dip of  $40^\circ$  to the north. The road began to rise quickly as a narrow gorge, along which we came out first into the forest zone and then to the sub-alpine zone. Both of them were covered with luxuriant arboreal vegetation: beautifully flowering rowan (*Sorbus tianshanica*) and argai (*Cotoneaster racemiflora*), *cher-ganak* (*Berberis heteropoda*), meadow-sweet (*Spiraea hypericifolia*), honeysuckle (*Lonicera caerulea*), and archa (*Juniperus pseudosabina*). I was struck by the penetration of some steppe forms of vegetation to these heights, as for example, *Acanthophyllum pungens*, non-climbing convolvulus (*Convolvulus gortshakovi*), echinocloa (*Anabasis phyllophora*), and so on. The outcrops of solid rock encountered along this way were no less interesting to me. In one place, to the right of the path I came upon a very instructive exposure of diorite porphyry, which from both sides uplifted a bed of conglomerate, which had a clear orientation from west-north-west to east-south-east and an dip of  $30^\circ$  to the north on one side, and  $20^\circ$  to the south on the other.

Eventually we reached the top of the pass, going rather steeply up the slope, which was thickly covered with arboreal vegetation. On its pass Turaigyr does not form a wide ridge, as Seirek-tash does, but forms a narrow crest. A hypsometric measurement gave 2,000 metres of absolute height for the pass. At one o'clock in the afternoon the thermometer showed  $14.5^\circ\text{C}$ . At the top of the pass dioritic porphyry sharply abutted onto reddish granite.<sup>1</sup> The view from the pass was unusually extensive and entrancing. To the north, beyond the lower parallel chain of Seirek-tash, it was possible to view the entire Ili plain up to the remote snowy peaks of the Semirechensk Alatau, while below, to the left at our feet one could see the Chilik's exit from the Turaigyr gorge. On the southern side of the pass ahead of us there stretched the southern chain of the Zailiiskii Alatau, which rose picturesquely as a snow wall. And beyond its drop to the left, in the far south-east with its shining snow cover was the most gigantic group in the Tian'-Shan', Tengri-tag. At our feet on the southern side of the pass and to the left of us the river Charyn, formed here by the confluence of the rivers Kegen and the three Merke, was carving a channel for itself in an awfully deep gorge.<sup>2</sup> The flora at the top of Turaigyr were not yet alpine in character.<sup>3</sup>

Coming down from the Turaigyr pass on our way to the gorge, we managed to locate a spring, which had a temperature of  $3.2^\circ\text{C}$ , and here we made an overnight camp. At eight o'clock in the evening the air temperature was  $9.2^\circ\text{C}$ .

<sup>1</sup> Kosharov no. 130 (3).

<sup>2</sup> Kosharov no. 95.

<sup>3</sup> [Semenov:] Here is the list of the plants collected while I was crossing Turaigyr on 4 June 1857: *Atragene alpina*, *Thalictrum minus*, *Papaver pavonium*, *Goldbachia laevigata*, *Polygala comosa*, *Cara-gana aurantiaca*, *Potentilla recta*, *Pot. nivea*, *Pot. sericea*, *Cotoneaster intermedia*, *Cot. multiflora*, *Saxifraga hirculus*, *Lonicera microphylla*, *Patrinia intermedia*, *Scabiosa caucasica*, *Senecio sibiricus*, *Saussurea pygmaea*, *Androsace maxima*, *Polemonium caeruleum*, *Myosotis arenaria*, *Pedicularis physocalyx*, *Dracocephalum nuians*, *Scutellaria orientalis*, *Anabasis phyllophora*, *Ephedra* sp., *Ixiolirion tataricum*, *Iris ruthenica*, *Eleocharis palustris*, *Phleum pratense*, *Alopecurus ventricosus*.

Before sunset we made an ascent of a mountain, which rose directly above our bivouac, from where the artist Kosharov captured views: of the Charyn gorge<sup>1</sup> to the right, and of the Santash mountain pass and remote Tengri-tag<sup>2</sup> to the left.

On 5 June we left our camp on the southern slope of Turaigyr at eight o'clock in the morning, and by midday had descended to the Dzhalanash plateau, in which the labyrinth of the three Merke (Uch-Merke) rivers, the Kegen and the Charyn, already familiar to me from the previous year, had sunk deeper. The plateau had sandy-clayey soil, partly strewn with boulders and debris of solid rock, but nevertheless more fertile than the plateau which separates the foot of Seirek-tash from Turaigyr. There was no arboreal vegetation at all on the southern slope of Turaigyr but the mountains rising beyond the river Charyn were covered with forest. Having come down to the plateau, we made a halt at midday and took a hypsometric measurement, which showed 1,430 metres of absolute altitude. The weather was clear; the Celsius thermometer showed 19°.

At approximately two o'clock in the afternoon we reached a precipice above the river Charyn, the valley of which was cut no less than a hundred metres deep into the plateau. The slopes of this deep valley afforded a full understanding of the tectonics of the entire plateau, which was cut through by the labyrinth of the three rivers, merging in the depth of the valley and forming the river Charyn in its stormy and deep cascading course, known under the name of Ak-togoi.<sup>3</sup> The slopes of the valley cut into the plateau consist of sandy, poorly cemented deposits, filled with innumerable boulders, attaining huge sizes and forming, when they are more firmly cemented, the solid rock which geologists called pudding [conglomerate]. The view from the precipice above the Charyn, and generally from the plateau was delightful. In the southern chain of the Zailiiskii Alatau, which rose in front of us as a snow wall, one could count up to thirty snowy peaks, while in the more distant Tian'-Shan' up to fifteen far higher giants could be seen.

At about three o'clock in the afternoon, continuing our journey across the plateau, we reached our descent into the valley of the first Merke, which through the solid rock of the plateau was carving for itself a channel almost as deep as the river Kegen, which forms the river Charyn after its confluence with the three Merke.

On our descent into the valley we were met with *kumys* by *batyr* Atamkul at the head of his advance-guard, sent by Tezek. Together with him we stopped there for the night on the river bank, where a hypsometric measurement showed 1,350 metres of absolute height, that is eighty metres lower than our camp at the Dzhalanash. Making use of the fact that it was not yet late in the day, I made an excursion along the valley down to the place where the Merke, merging with the

<sup>1</sup> Kosharov nos. 81 and 102.

<sup>2</sup> This view has not been positively identified, but it may be Kosharov no. 145.

<sup>3</sup> Kosharov no.70.

river Kegen form a rapid current, known by the name of Ak-togoi. The precipices of the valley of the first Merke were covered with quite luxuriant vegetation, and on my way I was able to make a fairly plentiful collection of plants of local flora, among which I managed to find two totally new types of astragal, which later received the names: *Oxytropis merkonensis n. sp.* and *Astragalus leuclidus n. sp.*<sup>1</sup>

We returned to our camp at the first Merke<sup>2</sup> with a rich collection of plants and rocks.

On 6 June at seven o'clock in the morning the thermometer showed 19.5°C. Since the extensive high plateau, into which the whole Uch-Merke labyrinth was cut, directly adjoined the Tian'-Shan', we were left with only two traverses before reaching the camps of Bogintsy *manap* Burambai, which were situated in the forest and sub-alpine zones of the Tian'-Shan' foothills at the point where the headstreams and tributaries of the river Karkara emerge from the Tian'-Shan' gorges onto the plateau.

With favourable weather on 6 June we managed that day, firstly, to get out of the deep gorge of the first Merke onto the plateau,<sup>3</sup> then to descend the valley of the second Merke, the slopes of which turned out to consist of the same rock and then we descended again into the deep valley of the third Merke, which proved to be marshy. As we emerged from this last valley, at the foot of huge crags of porphyry, we were overtaken by the entire picturesque detachment of the Atbans led by Tezek and Atamkul, which had left the valley of the river Cheprashty, where it had stayed over the night of 6 June.

By that evening, having separated from the Atbans before leaving for the foothills of the Tian'-Shan', we arrived at our overnight camping place, which we chose in isolated terrain at Tiek-taz, by a small spring which fell into the river Kegen not far from its exit from the Tian'-Shan' foothills. Here I made a hypsometric measurement, which showed 1,660 metres of absolute height; therefore this area was in the forest zone and that of alpine meadows. At seven o'clock in

<sup>1</sup> [Semenov:] The remaining plants, collected that day (5 June) in the valley of the river Merke, were the following: *Clematis songarica var. integrifolia*, *Atragene alpina*, *Berberis heteropoda*, *Glau-cium squamigerum*, *Fumaria vaillanti*, *Turritis glabra*, *Alyssum linifolium*, *Berteroa incana*, *Draba nemorosa*, *Thlaspi arvense*, *Sisymbrium sophia*, *Erysimum canescens*, *Camelina microcarpa*, *Arenaria serpyllifolia*, *Cerastium alpinum*, *Thermopsis lupinoides*, *Medicago falcata*, *Trigonella orthoceras*, *Caragana frutex*, *Car. aurantiaca*, *Car. tragacanthoides*, *Lathyrus pratensis*, *Onobrychis viciaefolia*, *On. pulchella*, *Coronilla varia*, *Prunus prostrata*, *Spiraea hypericifolia*, *Potentilla bifurca*, *Fragaria moschata*, *Rosa laxa*, *Rosa platyacantha*, *Cotoneaster multiflora*, *Lonicera hispida*, *Lon. caerulea*, *Lon. microphylla*, *Asperula aparina*, *Patrinia intermedia*, *Artemisia vulgaris*, *Gnaphalium silvaticum*, *Acanthocephalus amplexifolius*, *Serratula tenuifolia*, *Scorzonera purpurea*, *Codonopsis ovata*, *Campanula steveni*, *Onosma simplicissimum*, *Myosotis silvatica*, *Pedicularis sp.*, *Ped. dolichorrhiza*, *Salvia silvestris*, *Dracocephalum ruyshiana*, *Eremostachys sp.*, *Scutellaria orientalis*, *Thymus serpyllum*, *Polygonum acetosum*, *Euphorbia pachyrrhiza*, *Populus suaveolens*, *Ursica cannabina*, *Ephedra sp.*, *Juniperus sabina*, *Koeleria gracilis*.

<sup>2</sup> Possibly Kosharov no. 48.

<sup>3</sup> Kosharov no. 51.

the evening the thermometer showed 9°C, while the flora of the surrounding plateau displayed the character of a zone transitional from forest to sub-alpine.<sup>1</sup>

Early on the morning of 7 June we moved off from our camp at Tiek-taz and made for the Bogintsy nomad camps at the river Malaia Karkara by the nearest track. The old patriarch of the Bogintsy tribe,<sup>2</sup> almost eighty years of age, greeted me with unusual friendliness in the *aul* of his cousin, who was notable for his incredible obesity. Burambai's joy at the arrival of Russian assistance was explained by his absolutely critical situation, as the whole eastern half of the basin of Lake Issyk-kul', which was in his domain, was virtually already lost to him. He had evacuated it along both the northern and the southern shores of the lake (along the Kungei and Terskei) since his defeat in the autumn of 1854 and moved to winter quarters beyond the Santash Pass, leaving behind only a few *auly* in the valleys of the rivers Tiup and Dzhargalan, the eastern tributaries of the lake. It was to these *auly* that the Sarybagish tirelessly directed their *baranty*, and during one such raid, while Burambai was in Terskei with his forces, they managed to outflank him from Kungei and from there to reach his *auly* at the river Tiup, and to smash them completely, taking prisoner part of his family, namely one of his wives and the wives of his three sons. That happened at the end of 1856, after which Burambai led a nomadic existence beyond the Santash, and the Sarybagish already considered the whole basin of Issyk-kul' to have been conquered by them, especially after the following episode, which occurred in the spring of 1857.

One of the powerful Bogintsy clans, the Kydyk, led by *Biy Samkala*, and bearing the same relationship to Burambai as the appanage princes did to the grand

<sup>1</sup> [Semenov:] Here is a list of plants collected by me during my stay at Burambai's nomad camps on the Karkara plateau and Santash at a height of 1,660 to 1,830 metres: *Thalictrum simplex*, *Anemone narcissiflora*, *Adonis vernalis*, *Ranunculus polyanthemus*, *Delphinium speciosum*, *Berberis heteropoda*, *Barbarea vulgaris*, *Turritis glabra*, *Cardamine impatiens*, *Eutrema alpestre*, *Viola biflora*, *Parnassia ovata*, *Polygala comosa*, *Gypsophila altissima*, *Cerastium dauricum*, *Cer. alpinum*, *Geranium collinum*, *Ger. rectum*, *Thermopsis lupinoides*, *Medicago platycarpa*, *Cicer songaricum*, *Vicia sepium*, *Vic. cracca*, *Lathyrus pratensis*, *Hedysarum obscurum*, *Geum intermedium*, *Sanguisorba alpina*, *Alchemilla vulgaris*, *Potentilla viscosa*, *P. recta*, *Cotoneaster racemiflora*, *Ribes atropurpureum*, *Rib. rubrum*, *Saxifraga sibirica*, *Carum carvi*, *Lonicera hispida*, *Lon. karelini*, *Galium saxatile*, *Valeriana officinalis*, *Acter limonifolius*, *Inula helenium*, *Achillea millefolium*, *Gnaphalium silvaticum*, *Senecio sibiricus*, *Crepis sibirica*, *Hieracium vulgatum*, *Codonopsis ovata*, *Campanula steveni*, *Primula nivalis*, *Polemonium caeruleum*, *Myosotis silvatica*, *Solenanthus nigricans*, *Veronica spicata*, *Rhinanthus crista-galli*, *Pedicularis sp.*, *Ziziphora clinopodioides*, *Nepeta nuda*, *Dracocephalum altaianse*, *Dr. ruyshiana*, *Lamium album*, *Rheum rhaponticum*, *Rumex aquaticus*, *Polygonum polymorphum*, *Thesium refractum*, *Hippophae rhamnoides*, *Euphorbia subamplexicaulis*, *Euph. esula*, *Picea schrenkiana*, *Orchis turkestanica*, *Iris guldenstaedtiana*, *Allium obliquum*, *Veratrum album*, *Juncus bufonius*, *Carex sp.*, *Carex nutans*, *Elymus sibiricus*, *Bromus erectus*, *Poa soongarica*, *Avena pubescens*. I became acquainted with all this interesting flora during my three-day travels at the nomadic camps of Burambai on the Karkara plateau and Santash and during my first ascents to the foothills of the Tian'-Shan'. It was here during these days that I managed to find that new plant of the species of *Astragalus*, which later received the name of *Astragalus leucocladus n. sp.*

<sup>2</sup> Sultan Burambai, Kosharov no. 7.

princes in ancient Russia, had quarrelled with the chief Bogintsy *manap* and having detached himself from him, decided to move with his whole clan, numbering 3,000 men capable of carrying weapons, beyond the Tian'-Shan', across the Zauka Pass. The Sarybagish, who already occupied the whole southern littoral of Issyk-kul' (Terskei), insidiously let the rebellious Kydyk go through to the Zauka Pass, but when the latter with all their flocks and herds were ascending the pass, they attacked from both sides, in the rear from Issyk-kul' and in front from the Naryn, that is from the upper reaches of the Syr-dar'ia, and completely routed them. All the flocks and herds of the Kydyk were taken away from them. A great number of their people perished in battle or were made prisoners, and only a small remnant of the three-thousand-strong clan escaped across the high valleys of the Tian'-Shan' alpine zone and returned willy-nilly to be Burambai's subjects.

However, old Burambai grieved not so much for the losses of the Kydyk, who had wilfully defected from him, as for the loss of all his territory in the Issyk-kul' basin, of his arable lands and small orchards on the river Zauka and for the female captives of his family.

The *aul* in which my first acquaintance with Burambai occurred was located on Santash itself. From the place of our first meeting, by half past four in the afternoon we reached Burambai's own *auly*, which were situated somewhat higher than the pass at Santash. Here I made a hypsometric measurement, which showed 1,800 metres of absolute altitude.

On the evening of 7 June I became acquainted with the whole family of the esteemed *manap*. He had four wives. Alma,<sup>1</sup> the eldest, conducted herself with great dignity. Taken prisoner by the Sarybagish in the autumn of 1856, she was exchanged for distinguished Sarybagish prisoners taken prior to the spring of 1857. Another of Burambai's wives, by the name of Meke, was still in captivity, together with the wives of Burambai's sons. His two remaining wives were encamped in their own *auly* a few *versts* away from the eldest one. Of the *manap*'s four daughters I saw only one, by the name of Dzhuzium,<sup>2</sup> who was quite good-looking, but the most beautiful one, Meiz, did not enter her father's *iurta*. The *manap* hastened to introduce his four sons to me. Klych,<sup>3</sup> the eldest, was not less than fifty years of age. He looked like his father and was of the unattractive type of Karakirgiz. The second son, Emirzak,<sup>4</sup> was distinguished by his intelligent face and was of the type of Kirgiz of the Great Horde; the third one, Tiurkmen, was of pleasing appearance, but seemed to be simple-minded; while the fourth, Kanai,<sup>5</sup> was a handsome boy of about thirteen. The wives of Klych and Emirzak were held in captivity by the Sarybagish.

<sup>1</sup> Alma, eldest wife of *manap* Burambai, Kosharov no. 43.

<sup>2</sup> Dzhuzium, daughter of *manap* Burambai, Kosharov no. 43.

<sup>3</sup> Klych, eldest son of Burambai, Kosharov no. 2.

<sup>4</sup> Emirzak, son of Burambai, Kosharov no. 5.

<sup>5</sup> Kanai, youngest son of Burambai, Kosharov no. 2.

The night, which I spent in a spacious and excellent *iurta* erected for me in Burambai's *aul* at an altitude of 1,830 metres, was cold. On the morning of 8 June there was even a light frost. In the morning Sultan Tezek arrived with his detachment of the Kirgiz of the Great Horde.

The rumour that a strong Russian detachment, which had come to defend the Bogintsy domains, had appeared at the foot of the Tian'-Shan', spread like lightning round the entire Issyk-kul' basin. They said that I carried a small weapon (a pistol), from which I could shoot as many times as I liked. The rumours, spread about us with the usual exaggeration of our strength and weapons, produced a magic effect. The Sarybagish quickly moved off from the camps, which they had conquered from the Bogintsy on both shores of Issyk-kul' (Terskei and Kungei), and fled partly to the western extremity of the lake and even further to the rivers Chu and Talas, and partly even beyond the Tian'-Shan' to the upper reaches of the Naryn, in consequence of which I had the opportunity to fulfil my intention to penetrate into the heart of the Tian'-Shan' in the direction of a meridian drawn through the middle of Lake Issyk-kul' over the most accessible of its passes, the Zauka.

On 8 June I had a final consultation with Burambai and Tezek on this subject. I explained to them that I was going ahead with only my escort of fifty Cossacks and Bogintsy guides along the southern shore of Issyk-kul' (Terskei) and on reaching the river Zauka, I would turn south in order cross the Zauka Pass to the sources of the Naryn (Syr-dar'ia). During all this time Tezek with his detachment would have to stay to guard Burambai's encampments, even if by chance the latter decided to move forward after me and re-occupy his Issyk-kul' lands.

Burambai was delighted. My ascent of the Tian'-Shan' along the Zauka valley would serve his purpose in the best possible way, as he would secure possession of the most important of the Tian'-Shan' mountain passes and his primordial arable lands and orchard plantations along the river Zauka. That is why Burambai himself volunteered to provide me free of charge with the required number of horses and camels for my first journey into the heart of the Tian'-Shan'.

The whole day of 8 June passed in gathering horses and camels.<sup>1</sup> The night of 9 June was still cold at the camps of Burambai, but by nine o'clock in the morning, in the sunshine it was already hot (up to 20°C).

<sup>1</sup> Camels, Kosharov no. 24.



## CHAPTER 4

# The Heart of the Tian'-Shan'

*My departure with the Cossack detachment into the heart of the Tian'-Shan' in 1857. Santash Pass. The Bogintsy captives. The river Ak-su. Meeting with the Sarybagish at the river Karakol. Zauka Pass and the upper reaches of the Naryn. Dead battle-field. Caves. The Issyk-kul' bay Kyzyl-su and the lake's shores. The river Tiup. The sources of the Naryn. The ancient Usuns. Alpine meadows. The Kungei and Terskei Alatau. An encounter with a Sarybagish baranta. Tabul'gaty Pass. A visit to the upper reaches of the rivers Kok-dzhar and Sary-dzhas. The duana. Khan-tengri and its glaciers. The river Tekes. My mediation between Burambai and Umbet-Ala and the four female captives. News of the death of Adolf Schlagintweit in Kashgar. A trip to Musart and an expedition to the rescue of Tezek. Kurmenty Pass. The rivers Chilik and Turgen. Return to Vernyi. Return journey. The Ili plain. A visit to Tezek. The Lepsa. Lake Ala-kul'. Tarbagatai. Return to Semipalatinsk. Barnaul. Omsk. Return to Petersburg.*

On 9 June, with indescribable delight, I set out at last with my whole detachment on my first journey into the heart of the Tian'-Shan', which had already faced me for a long time. My detachment consisted of forty-nine Cossacks; one of the Cossacks fell ill and I left him behind in the care of the Bogintsy together with my serf-servant, who was also taken ill, either in reality or pretending. Over and above the Cossacks, my detachment comprised twelve Karakirgiz guides and camel-drivers, given to us by Burambai, and my faithful fellow-traveller, the estimable artist Kosharov. One of the Cossacks was permanently attached to me in the capacity of interpreter, as he had a superb command of the Kirgiz languages. In our detachment, besides sixty-three good Karakirgiz saddle-horses which we rode, we had also twelve camels.

Our whole caravan very quickly left Burambai's *auly* for the nearby Santash mountain pass, over the watershed between the Ili and Issyk-kul' basins. Santash rose only slightly above Burambai's nomad camps and received its name from a pile of stones ('Santash' means 'a thousand stones') heaped on the shore of a small lake.

The following legend has been preserved among the Karakirgiz concerning this pile of stones. When, in the last quarter of the fifteenth century, Timur (Tamerlane) undertook his first campaign from Samarkand by the southern shores of Lake Issyk-kul' into the distant eastern countries of Asia, he made his way to the present Chinese Ili province, from the Issyk-kul' basin into the Ili, across the most convenient pass, which received the name of Santash only after Tamerlane's campaign due to the following circumstance. As Timur was proceeding at the head of an innumerable army, at the pass leading into the countries which were not yet under his dominion, he took it into his head to count the number of his forces still before the military operations began. For this purpose, while passing Issyk-kul's shores, he ordered each of his warriors to take a stone with him. While traversing the pass, Timur ordered his troops to lay the stones in a heap on the shore of a lake located in the pass. Thus, the number of stones placed in the pile represented the total number of the host which crossed the pass. However, after a prolonged campaign, having defeated all his enemies in a multitude of battles and having conquered vast lands in the east, when Timur was returning to his capital by the same route across Santash, he decided to carry out a new count of his victorious army and ordered each warrior coming back across Santash to take a stone from the pile laid there. This pile became greatly diminished, but then, when it was counted, its number represented on the one hand the number of warriors killed during the campaign, and on the other hand remained for ever their memorial, laid in an alien country with their own hands.

From Santash, after covering no more than five *versts*, we came out to the basin of Lake Issyk-kul' at the top of its western tributary, the river Tiup. On the bank of this river that day (9 June) I managed to find a completely new *Compositae* plant of the *Tanacetum* family, later described by the botanist Herder under the name of *Tanacetum semenovi*.

In order to get from the Tiup into the valley of the river Dzhargalan, flowing parallel to it, but more to the south into Issyk-kul' and already familiar to me from my journey of 1856, I crossed the wide valley of the Tiup diagonally and started climbing the low mountain ridge of Kyzyl-kii, which separated the two valleys, and which was covered with spruce forest in its upper part, where it already joined the Tian'-Shan'.

From the pass a magnificent view unfolded of the frontal chain of the Tian'-Shan', to which the mountains of Kyzyl-kii belonged. Having come down from the foot of this mountain into the valley of the Dzhargalan, which emerged here from the gorges of the Tian'-Shan', I could see from here the entire longitudinal valley of the Dzhargalan and the discharge into it of the river Turgen'-ak-su, issuing from the Tian'-Shan' gorges, and also the whole main chain of the Heavenly Ridge (Tian'-Shan'), shining with its everlasting snows, which the Kirgiz called Mus-tag (The Snowy Mountains).

Although the longitudinal valley of the Dzhargalan, yielding little in its altitude to the height of Santash, was already in the zone of coniferous forest, there was so little woodland that the local flora was entirely like that of the agricultural zone of the Trans-Ili territory, where Vernyi and all the Russian settlements of the Trans-Ili foothill region were situated.

It was this that later made it possible for a Russian colony to settle firmly in the Issyk-kul' basin and to establish here by the river Karakol a flourishing urban settlement which later received the name of Przheval'sk from Przheval'skii's grave,<sup>1</sup> situated near it.

Having come down from the Kyzyl-kii into the Dzhargalan valley, we began to encounter whole crowds of Bogintsy, who were trudging on foot from Sarybagish captivity, as they had been abandoned by the Sarybagish who quickly vacated the lands conquered by them at Issyk-kul' before our arrival. The captives were dragging themselves along, hungry, emaciated and half-clothed, so that we had to share our food with them, in order that they should not starve to death. Fortunately, we were driving with us from Santash a whole flock of sheep, which I had bought from the Bogintsy, and had a good supply of *kurt* (cheese), presented to me by Burambai.

At the river Turgen'-ak-su, below its emergence from a mountain gorge, we made an afternoon halt among bushes of sea buckthorn (*Hippophae rhamnoides*), black barberry (*Berberis heteropoda*) and willow (*Salix*). Having moved off from our camp at about one o'clock in the afternoon, instead of making directly for Terskei, the southern littoral area of Issyk-kul', I decided to stop overnight at a place which keenly interested me, namely a nearby ravine of the Tian'-Shan' itself, in which there was the warm medicinal spring of Alma-Arasan, far-renowned among the Karakirgiz, and from which the mountain river Ak-su, a tributary of the Dzhargalan, was making its way onto the Issyk-kul' plain.

On leaving our bivouac at the Turgen'-ak-su we crossed three rivulets, known among the Karakirgiz by the name of Dzherges. The current of the last of them, which was wide and swift, though shallow, was thickly overgrown with beautiful trees. Eventually, there appeared the gorge of Ak-su, the objective of our journey. We turned towards it and went up into the foothill terrain, from where there was now a good view of the blue Issyk-kul' with its two bays and the cape dividing them. It was from this ground that we came down into the river Ak-su's gorge itself. Having reached the gorge, we proceeded along it for about five *versts*, by a path which led along the left bank of the river high above its rapid, noisy and foaming course, which justified its name of Ak-su (White water). The steep precipices of the mountains were thickly overgrown, partly with spruce forest,

<sup>1</sup> Nikolai Mikhailovich Przheval'skii, the famous explorer of Central Asia, died in 1888 during his fifth expedition to Mongolia and Tibet and was buried at Karakol, a settlement that had been founded in 1869 and was renamed Przheval'sk in 1893.

partly with woods of various deciduous trees, among them the apple-trees from which the medicinal spring derived its name, Alma-Arasan.

Within half a *versta* of the Arasan there appeared outcrops of coarse-grained granite,<sup>1</sup> slightly uplifting the sedimentary rocks, namely light grey limestones, which presented an excellent profile with an orientation from east to west and a dip of 29°. Half a *versta* before the Arasan, from the path along which we were picking our way with difficulty high above the noisy and foaming river, we began to go down a very steep and rocky slope to the Arasan itself.

The sun was already hidden behind the mountains when, by seven o'clock in the evening, we reached the famous spring,<sup>2</sup> near which we settled for the night. The entrance to the Arasan basin was blocked by wooden gates, on which I found still intact Tibetan inscriptions<sup>3</sup> similar to those that we had seen at Tamgaly-tash on the river Ili thirty *verst*s below the Ili picket. A warm spring, on emerging from beneath the ground, was separated off into a quite spacious pool two metres long, one metre wide and one metre deep and faced with granite. Its temperature turned out to be 40°C. The smell of the spring was sulphurous, but one could not see any discharge of gases and there were no bubbles. Their emergence was prevented by a quantity of gravel at the bottom of the Arasan; amidst this gravel one could not see the place where the spring came out from under the ground. From the Arasan basin there flowed a stream, a few metres long, discharging into the river Ak-su. This river was rushing rapidly along the gorge over huge rocks; it was very foamy, and here and there was cascading as waterfalls. At seven o'clock in the evening its temperature was 11°C, with an external air temperature of 15°C. A hypsometric measurement gave the absolute altitude of our camp as 1,810 metres.

Having woken up on 10 June at five o'clock in the morning at our camp near the warm spring, I hastened with special pleasure to look around the ravine of the river Ak-su, since it was the first valley of the central Tian'-Shan' into which I had managed to penetrate. In order to explore the nature of this valley as far as possible, I decided to go a few *verst*s up the right bank of the river and then to come down by the left bank to its end, and to come out onto the Issyk-kul' plateau through a gorge which was very difficult of access, and along which it was absolutely impossible to pass with my numerous detachment, pack-loads and camels. However, I sent my entire detachment immediately ahead by a roundabout route with Kosharov, the artist, so as to join him where, having come down from his camp to the Issyk-kul' plain, he would be crossing the river Karakol at the place where a few decades later there appeared the town of Karakol (Przheval'sk).

At the same time (10 June 1857), when no Russians, apart from the Cossacks escorting me, had ever been in this locality, wishing to travel as light as possible,

<sup>1</sup> Kosharov sketch no. 125 (1).

<sup>2</sup> Kosharov no. 128 and 129 (1).

<sup>3</sup> Kosharov no. 129 (2).

I took with me only a Cossack interpreter, my inseparable travelling companion, and a Karakirgiz guide who knew the district well.

The question of whether there were volcanic rocks in the 'Tian'-Shan' was paramount for me, and since I had already become convinced that the crystalline rocks of the Ak-su valley, which slightly raised the strata of the sedimentary rocks (limestones and schists of the Palaeozoic system), turned out to be granites and syenites, it only remained for me to investigate carefully whether volcanic rocks could be found among the numerous boulders carried along by the rapid river from the remote heights of the Heavenly Range. But there were no volcanic rocks to be found among the boulders of the river in its valley. I could concentrate wholly on an exploration of the flora of the Ak-su valley and on making a full collection of plants encountered there, which over the whole area explored turned out to belong to the sub-alpine, forest and partly cultivated agricultural zones.

The valley's arboreal vegetation was composed of coniferous species: central Asiatic spruce (*Picea Schrenkiana*), which goes up to the Himalayan range; *archa* (*Juniperus sabina*), also typical arboreal types of central Asiatic mountain ranges; and of deciduous species: wild apple (*Pyrus malus*), rowan (*Pyrus sorbus*) and the following typical central Asiatic species of shrubs: black barberry (*Berberis heteropoda*), *irgai* (*Cotoneaster nummularia*), *boiarka* (*Crataegus pinnatifida*), two types of currant (*Ribes atropurpureum* and *R. rubrum*), and two types of honey-suckle (*Lonicera hispida* and *L. microphylla*). As for the herbaceous flora, it had resembled partly the flora of the cultivated zone of the Trans-Ili territory, partly that of the forest and even sub-alpine zones.<sup>1</sup>

Having thoroughly explored the flora of the Ak-su valley within a few *versts* upstream from our camp, we turned back and began to descend along the left bank of the river. The going was very difficult, as the valley had the form of a wild gorge, overgrown with luxuriant vegetation. Only about five *versts* below Arasan the valley became wider, and since we were travelling along its high left extremity, there gradually unfolded an extensive view of the entire Issyk-kul' plain.

Soon, at the foot of the mountains we saw a wide river, shining like a silver ribbon, which a few dozen horsemen were crossing. That river was the very Karakol by which we had arranged to meet our detachment. Naturally, from a distance we took the horsemen who were going across for our own detachment, but we soon noticed our mistake and perceived that it was a strong force of well-armed Sarybagish, travelling from east to west and fording the Karakol, which

<sup>1</sup> [Semenov:] Here is a full list of plants collected by me on 10 June in the valley of the river Ak-su above and below Alma-Arasan: *Thlaspi arvense*, *Sisymbrium brassicaeforme*, *Capsella bursa-pastoris*, *Nasturtium palustre*, *Dianthus crinitus*, *Silene viscosa*, *Linum perenne*, *Malva borealis*, *Trifolium repens*, *Astragalus vicioides*, *Galium boreale*, *Artemisia vulgaris*, *Lappa tomentosa*, *Mulgedium azureum*, *Campanula glomerata*, *Asperugo procumbens*, *Verbascum phlomoides*, *Veronica anagallis*, *V. biloba*, *Dracopcephallum integrifolium*, *Scutellaria alpina*, *Sc. galericulata*, *Lamium album*, *Eremostachys sanguinea*, *Urtica dioica*, *Iris guldenstadiana*, *Triticum prostratum*.

was very full at that time. The Sarybagish, having noticed us, sent several horse-men to meet us. Our situation was perilous, as a hostile reception seemed unavoidable. Our descent was steep and difficult and, to our cost, in one place we had to jump over a cleft; moreover, the horse of my faithful companion suffered some sort of injury to its spine, after which it could only walk. At last we found ourselves face to face with six hostile horsemen, from whom we were separated only by the narrow and not very deep fissure. Our weapons were in readiness, but without resorting to them we entered upon preliminary negotiations, as often happened in ancient times with hostile meetings between Russians and steppe nomads (Polovtsy).<sup>1</sup> To the Sarybagish's question as to who we were, we replied that we were Russians and belonged to that large detachment which had come to the assistance of the Bogintsy. And to the question where our detachment was then, we replied that it was very near, over the mountain and would soon appear. Then they told us that in the meanwhile they could very easily attack us and take us prisoner. We explained to them that it would cost them very dear, as we had on us weapons that could shoot as many times as we chose, and that in a battle against us they would only lose time, whereas now, having completed their river crossing before the arrival of the detachment, they could easily gallop away from our force. Luckily for us, suddenly from behind the high pass our detachment indeed began to come into sight. The sun played on the shining weapons of our foremost Cossacks, and then one after another, orderly and rhythmically, there proceeded our camels, accompanied by Bogintsy horsemen. It seemed that there was no end to our detachment descending from the hills. Our hostile interlocutors quickly galloped towards the ford, which the Sarybagish detachment had already managed to cross, and all of them began to tear along towards the southern shores of the lake.

Our detachment's descent and its crossing of the river took an hour and a half, and after that we rested for a short while on the sandy banks of the Karakol, which were greatly overgrown with barberry and sea buckthorn. Here I learnt from the accounts of Kosharov and the Cossacks the reasons for our detachment's delay. The circuitous route through the pass turned out to be quite inaccessible for our pack animals. The paths were so narrow and steep that more than once they had had to reload the camels. In one such place one of the pack-horses fell through with its load and completely smashed itself up. Its load had to

<sup>1</sup> Polovtsy (Kumans, Kipchaks), a Turkic tribe related to the Pechenegs and other Turkic peoples living on the steppes of Middle Asia. From the later eleventh century to the Mongol-Tatar invasions they made repeated raids on the southern frontiers of Kievan Rus. In defence of that border the Russians constructed fortifications and themselves undertook punitive raids, that of Igor Sviatoslavich in about 1185 being celebrated in the epic poem *Slovo o Polku Igoreve*. The demise of the Polovtsy came fairly suddenly as the Russian princes sought to consolidate their hold on the steppes, and the nomads dispersed into several kindred groups named after their leaders. Their culture is associated with at least some of the *kurgans* and stone statues found throughout the steppe. Vernadsky, *History of Russia*, vol. II.

be pulled out of the crevasse and divided among three spare horses. The Kirgiz, to whom this horse belonged, had embraced it and cried for it, as for a friend, and on parting with it, he cut off its ear and tail and took them with him. Of course, I hastened to make a gift of one of my spare horses to him.

Having moved off from our bivouac, we crossed several rivulets and at about one o'clock in the afternoon had our lunch by the river Chulpan, and then started again on the journey and by three o'clock in the afternoon reached the river Dzhety-oguz, where we stopped overnight. Here we met quite a few men, women and children, and they had with them some horses and oxen and three *iurty*. They were Bogintsy captives, freed by the Sarybagish, who had fled from the arable lands and irrigation ditches annexed by them from the Bogintsy after their defeat.

The view from our camp southwards through the Dzhety-oguz gorge to the Tian'-Shan' was entrancing.<sup>1</sup> The snow-white two-horned Oguz-bash blocked off the valley in the south and bore a resemblance to the Jungfrau<sup>2</sup> in the Bernese Alps, but was even more distinctive and magnificent both in its shape and its whiteness.

Since the evening had not yet set in, I had time to take a look at the Dzhety-oguz valley, the second of the Tian'-Shan' valleys that I visited. I did not come across any outcrops and confined myself to a thorough examination of the boulders piled up by the river. Among them were to be found the same granites as in the gorge of the river Ak-su, syenites, coarse-grained diorites, gabbro, grey limestones, black and red porphyry, a small quantity of gneiss, sandstones, amphibolites, hornblende schists and breccia, but no volcanic rocks. The Dzhety-oguz valley was densely covered with shrubs: black barberry, *irgai* (*Cotoneaster nummularia*), *boiarĕa* (*Crataegus pinnatifida*), honeysuckle (*Lonicera tatarica*) and sweetbrier (*Rosa cinnamomea*). All of this was intertwined with beautiful clematis (*Clematis songarica*).

On returning to our bivouac we enjoyed the extensive and magnificent view southwards over the boundless blue lake, and, beyond it, the high wall of the southern chain of the Zailiiskii Alatau (Kungei Alatau), which consisted of a whole row of *coulisses*, standing out as a continuous snowy crest. The sun was declining towards evening, above the Kungei dark clouds were floating, spectacularly illuminated by the sunset. While the snowy peaks of the Kungei Alatau had already begun to burn with their Alpine shimmering (*Alpenglŭhen*), the soft, cupola-shaped foothills were flooded with a light that made them look like smoke or a cloud, as if all these mountains were burning and smouldering.

On 11 June we left our camp and, having crossed the Dzhety-oguz, began climbing the saddle-like foothills which separated the main ridge of the Tian'-Shan' from its frontal chain, which the Karakirgiz called Orgochor. Having

<sup>1</sup> Kosharov no. 94.

<sup>2</sup> The view of the Jungfrau, evidently seen from Interlaken or Wilderswil, clearly derives from Semenov's visit to Switzerland in autumn, 1853. *Detstvo i iunost*, p. 260.

climbed up the sloping plain, we were now going further to the west-south-west at the same level, and after about twelve *versts* we reached the river Bol'shaia Kyzyl-su. To the right of us there opened up a magnificent view of the blue lake and of its beautiful quadrangular bay, protected by spits; the rivers Bol'shaia and Malaia Kyzyl-su discharged into it. To the left there was a marvellous view of the main Tian'-Shan' chain with its continuous row of snowy peaks. Along the way we came upon several graves and tumuli.

After a further five *versts* we crossed the Malaia Kyzyl-su, and still further on we now came out at the river Zauka, on which there was the famous mountain pass over the main crest of the Tian'-Shan', leading into Kashgaria and Fergana.

In front of the entrance to the Zauka valley<sup>1</sup> we encountered fifteen Bogintsy horsemen. This was a small reconnaissance detachment, sent by Burambai to investigate the place of the nomadic camps of the junior *manap* of the Sarybagish tribe by the name of Tiuregel'dy, who, by reason of his enterprise and courage, was the most dangerous enemy of the Bogintsy. Their exploratory *baranta* had not been a success: they were returning home without any plunder, but in terms of reconnaissance it was very successful: it brought comforting news for me that Tiuregel'dy was roaming from place to place far from the Zauka Pass in the less accessible, more westerly valleys of the Tian'-Shan', which were well protected against possible attacks by the Bogintsy. I could consider my ascent to the Zauka Pass to be quite safe, although Tiuregel'dy boasted that he would try to take captive the Russian '*ul'kuntiure*' (big chief), as the Karakirgiz called me.

After meeting the Bogintsy horsemen, I sent my whole detachment, now without any apprehension, along the route indicated by them, straight to the Zauka Pass, and as for myself, without baggage, accompanied only by my constant companion, the Cossack interpreter, and also by the head of the Bogintsy reconnaissance party, whom we had met and who enjoyed the special trust of Burambai, I engaged in a thorough investigation of the surroundings, which turned out to be equally interesting in both geological and historical respects.

The terrain across which we came to the river Zauka was called Kyzyl-dzhar. It derived its name of 'Krasnyi Iar' (Red Cliff) from a huge outcrop of rather loose red sandstone, filled with boulders and beautifully stratified with a clear alignment from east to west and a dip of 15° to the south. This interesting rock formation was Issyk-kul' conglomerate, of very ancient origin, found by me in this way for the first time at a distance of more than twenty *versts* away from the lake and at a considerable height above its level.

In historical terms the terrain was of no less interest. The historical role of this locality began as early as the seventh century AD. At that time (in the year 630) there penetrated hither the first traveller before me, an eye-witness who supplied geographical information about the Tian'-Shan' and Issyk-kul'. This was Huan-

<sup>1</sup> Kosharov no. 68.



tsang,<sup>1</sup> a Chinese Buddhist pilgrim, who passed through here on his way from one of the towns of Semigrad'e, situated to the south of the Tian'-Shan', namely Ak-su,<sup>2</sup> the capital of the Turkic *kagan* (khan). The pilgrim's route went through the Tian'-Shan', probably over the Zauka Pass, came down to the southern (Terskei) shore of Issyk-kul', along which it went further across the river Barskaun, came out from the western extremity of the lake to the river Chu, and passing through the Buam gorge, reached the upper reaches of the river Talas and the country of a 'Thousand springs' (Min-bulak). In this land there was at that time the headquarters of the Turkic Tugiue<sup>3</sup> *kagan*, bearing the name of Suiab.<sup>4</sup> A hundred years after Huan-tsang's journey, Suiab, the capital of the khans, was destroyed by the Chinese in AD 748, and eighteen years after that (in 766) was again occupied by the Kharluks,<sup>5</sup> people of the same Turkic tribe, who just like their fellow tribesmen, the Tukiue and the Kirgiz, came from southern Altai and the upper Enisei.

At that time the interesting area of Kyzyl-dzhar, where I was on 12 June, was occupied by the tribe of Dzhikil', an offshoot of the Kharluk tribe, who established their seat here, which received the name of Dzhar (Iar). Since the end of the eighth century the locality of Iar (Kyzyl-dzhar) rivalled in its population and culture other similar areas on the northern slope of the Tian'-Shan', namely Suiab in the country of 'a thousand springs' and Barskaun near the discharge of the river of that name into Issyk-kul'. In all these areas, even at the time of my travels in 1857, ancient ruins were visible, the remains of irrigation canals and orchard plantations, which were very ancient and had become completely wild, in the form of whole groves of apple-trees and apricot-trees. I could understand how much the area of Kyzyl-dzhar and the lower part of the Zauka valley were valued by Burambai, the elderly Karakirgiz *manap*, whose clan descended from the Dzhikil' khans who had chosen Kyzyl-dzhar to be their residence, and how the loss and destruction of his native hearth, his arable lands, small orchards and buildings depressed Burambai. Only after examination of the surroundings of

<sup>1</sup> For Huan-tsang, see Semenov, *Desstvo i iunost'*, chapter 6, note 3; Grousset, *Rise and Splendour*, pp. 140-43; Cable and French, *Gobi Desert*, also make extensive use of his descriptions.

<sup>2</sup> Ak-su, an ancient town in Malaia Bukhara (Eastern Turkestan) on the river of the same name flowing south-east to join the Tarim. The town, originally surrounded by a wall with four gates, possessed some 6,000 houses, six caravan-serais and five mosques in the late nineteenth century. Its prosperity derived from its position on the great trade route from Uch-Turfan to western China and it accommodated caravans from Russia, Turkestan, Kashmir, Ladakh and India. The route westwards passed over the Zauka Pass to Kul'dzha on the river Ili in Dzhungaria. Its inhabitants were renowned for weaving high quality cotton cloth, making saddles and other leather goods, and working precious stones and metals.

<sup>3</sup> Semenov uses both spellings, Tugiue and Tukiue; Levin and Potapov, *Peoples of Siberia*, pp. 443-4.

<sup>4</sup> Suiab was located in the vicinity of Pishpek, later Frunze; Herrmann, *Historical Atlas*, maps 32 and 37, where it is indicated as the seat of a Nestorian bishopric in the thirteenth century.

<sup>5</sup> The Kharluks originated in Altai and ruled Semirech'e in the eighth century following the decline of the Turkic khanate. Levin and Potapov, p. 308.

Kyzyl-dzhar did I realize what importance Burambai attached to the expedition which I planned into the heart of the Tian'-Shan', past the residence which he had lost, over the Zauka mountain pass. It brought back to him his motherland and the lands smiled on by nature, which had been the property of his ancestors for more than a thousand years, and also the wonderful pastures of the upper reaches of the Jaxartes (Syr-dar'ia) and of the Celestial Mountains, which had been seized by his enemies.

That is why the dispositions of the old *manap*, who considered my expedition to be his own business, were so vigorous. Burambai instructed the reconnaissance detachment's head, who was an intelligent person and enjoyed his trust, following our ascent of the Zauka Pass, to occupy, with the assistance of Sultan Tezek's detachment which was to arrive after me, not only the Kyzyl-dzhar locality and the Zauka valley, but also the whole Terskei as far as the mouth of the Barskaun, which Burambai considered to be the boundary of his domain with that of the Sarybagish. At the same time, Bogintsy and Atban mounted patrols were to guard our rear from a flanking movement and attack by hostile Sarybagish during the whole period of our ascent of the Zauka Pass and to the source of the Naryn (the upper Jaxartes).

Thus safeguarded, I parted with my fellow-traveller (the head of the Bogintsy detachment) and, accompanied only by my Cossack interpreter, made haste to catch up with my detachment on its way to the Zauka valley. Having galloped for two hours, at about one o'clock in the afternoon we now found our detachment at a bivouac in the valley of the river Zauka after a thirty-*versts* journey during that day. Immediately on my arrival the entire detachment moved off from their bivouac, and we went forward. After several *versts* of our ascent, the river divided into two branches, and we went along the western one, which seemed to us to be the main one.<sup>1</sup>

The valley was wide and thickly covered with a beautiful fir forest. All the rock outcrops were left aside, but everywhere along my way I came across masses of syenite boulders. The views along the valley were fascinating. Opening up directly in front of us to the south was a marvellous group of snow peaks (*belki*), trimmed at the bottom with a wide edge of tall-trunked fir forest. Further to the right and left of this group we were delighted by bold rocky crests, which consisted of syenite spikes and towers, on which the snow clung only here and there. In two places we noticed streams, which were dashing down sheer from the mountains, and one of which was falling like Staubbach,<sup>2</sup> but with a lesser

<sup>1</sup> Kosharov no.115.

<sup>2</sup> The Staubbach Falls, descending 280 metres into Lauterbrunnen, Bernese Oberland, inspired Goethe to write his poem *Gesang der Geister über den Wassern* in 1779 and were visited by Semenov in 1853. Lubbock in his *Scenery of Switzerland*, p. 383, attributes the name ('Dust Stream') to the great height of the falls and relatively small volume of water, resulting in its being 'shivered into spray before reaching the bottom'. He also quotes Byron's description, which would have appealed to

volume of water. At last we entered thick shady groves of coniferous forest. In them I was struck by the number of young saplings, prevailing over old trees, as if the forest had appeared only recently, something that I had not come across in Asia until now. But on one slope I did notice an extensive area of trees, completely withered and fallen.

Having passed through this upper forest zone, we crossed to the right bank of the river over a difficult ford, and then after a steep ascent went along a flatter, gently rising valley, and having travelled for approximately fifteen *versts* along it, turned to the south-west. In the distance before us there was visible a whole group of snowy *belki*, one of which seemed to be closing off the valley. We travelled about five *versts* along the foot of the *belki*, and, on account of the tiredness of our horses and camels, at last stopped overnight at a place convenient for a bivouac for a large detachment. A hypsometric measurement gave 2,360 metres for this bivouac.

Here we encountered a countless multitude of marmots, jumping out onto the stones on our approach and beginning their characteristic piercing whistling. The rock outcrops above our bivouac in a narrow and deep gorge, across which a mountain spring was making its way, falling like a waterfall, consisted of syenite. The vegetation in the upper part of the forest zone which we had passed was sub-alpine and eventually totally alpine.<sup>1</sup> On 12 June at five o'clock in the morning the thermometer showed only 3.5°C. At five o'clock we started our ascent, but already after half an hour the river divided into two branches, of which the valley of one went south-west, and the valley of the other went due south. The latter was pointed out to us by all the Karakirgiz guides as the quicker, although more difficult, and less accessible for our detachment, ascent to the Zauka Pass.<sup>2</sup> We turned along this way, but here at the last pine-trees I decided to leave my

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Semenov's romantic poetic sensitivities: 'It is in shape, curving over the rock, like the tail of a white horse streaming in the wind – such as it might be conceived would be that of the 'pale horse' on which Death is mounted in the Apocalypse. It is neither mist nor water, but a something between both; its immense height gives it a wave or curve – a spreading here or condensation there, wonderful and indescribable'. The view remains unchanged to the present day and contrasts markedly with the full torrent at Giessbach.

<sup>1</sup> [Semenov:] Here is a list of the plants collected by me that day (12 June) along the way across the Zauka Pass: *Atragene alpina*, *Thalictrum alpinum*, *Pulsatilla albana*, *Ranunculus pulchellus*, *Isopyrum anemonoides*, *Berberis heteropoda*, *Chorispora bungeana*, *Erysimum cheiranthus*, *Thermopsis alpina*, *Caragana jubata*, *Oxytropis frigida*, *Hedysarum obscurum*, *Spiraea oblongifolia*, *Potentilla sericea*, *P. fruticosa*, *Comarum salessowi*, *Cotoneaster nummularia*, *Pyrus aucuparia*, *Sedum coccineum*, *Saxifraga sibirica*, *Lonicera hispida*, *Aster alpinus*, *Callimeris altaica*, *Erigeron uniflorus*, *Gnaphalium leontopodium*, *Doronicum oblongifolium*, *Adenophora polymorpha*, *Primula nivalis*, *Pr. longiscapa*, *Androsace villosa*, *A. septentrionalis*, *A. filiformis*, *Scrophularia incisa*, *Pedicularis rhinantoides*, *Gymnandra borealis*, *Dracocephalum stamineum*, *Dr. heterophyllum*, *Acantholimon diapensioides*, *A. hohenackeri*, *Chenopodium hybridum*, *Rheum emodi*, *Rh. spiciforme*, *Polygonum viviparum*, *Pol. polymorphum*, *Parietaria micrantha*, *Platanthera viridis*, *Fritillaria palidiflora*, *Tulipa altaica*, *Lloydia serotina*, *Carex atrata*, *C. nigra*, *C. frigida*, *C. capillaris*, *Festuca altaica*, *Bromus squarrosus*, *Avena pubescens*. In the forest, which consisted of spruce-trees (*Picea schrenkiana*), I noticed a lot of moss of the genus *Sphagnum*.

<sup>2</sup> Kosharov no. 50.

whole detachment with the pack-loads and camels and undertook the ascent to the top of the Zauka Pass accompanied only by Kosharov the artist, seven Cossacks and two Kirgiz with four pack-horses and two spares. Some of the Karakirgiz guides called the river, along which we had decided to go and which, according to their accounts, higher up was flowing through two lakes, Kashkasu, and others called it Zauka. Which of the two was more correct, I was unable to ascertain.

Having turned directly towards the south, we went at first along a fairly wide valley between cliffs consisting of black-green siliceous schists, which had replaced the syenites already somewhat below the bivouac at which I had left my detachment. The valley went up very rapidly. There began to appear plants of the alpine zone: *Callianthemum rutaefolium*, *Trollius altaicus*, *Caragana jubata*, *Comarum salessowi*, *Androsace villosa*, and so on. Alpine marmots,<sup>1</sup> as well as ground-hares or jerboas (*Dipus sagitta*)<sup>2</sup> incessantly appeared on the path. The precipices of whetstone black slates had an alignment to the west-south-west.

After approximately an hour and a half of difficult climbing we came out to a beautiful and transparent alpine lake<sup>3</sup> of marvellous aquamarine colour; it was from this lake that the river, along which we had come, had its source. In the lake beautiful *turpans* (*Casarca rutila*) of a wonderful red metallic colour were swimming. Having gone round the lake by its western side, we climbed a colossal pile of the same schists, from under which the river feeding the lake was flowing into it from the south. The view from this pile of rocks backwards across the lake to a series of high snow *belki* was delightful.

However, the crossing from the lower alpine lake to the upper one was incredibly difficult for our horses, as the whole valley between the two lakes was so obstructed and even partitioned with huge boulders and slabs of siliceous schists and shales, under which the river, beginning from its exit from the upper lake all the way to its discharge into the lower one, was so deeply buried that it was impossible even to suspect its existence. This phenomenon was similar to that which occurs in Western Europe with the course of the river Rhone at the place known as Perte du Rhone.<sup>4</sup> The vegetation on this whole pile of huge stones, under which the course of the river was buried, was sparse. However, I collected a few plants: two beautiful Cruciferae of brilliant yellow and lilac colour (*Erysimum cheiranthus*, *Hesperis matronalis*), one *Scrophularia* (*Scrophularia incisa*) and tall red Himalayan rhubarb (*Rheum spiciforme*).

<sup>1</sup> Probably *Marmota baibacina* (L.B.).

<sup>2</sup> It could not have been *Dipus sagitta*, the hairy-legged jerboa, which lives in hilly and barkhan sands. (L.B.).

<sup>3</sup> Kosharov no.71.

<sup>4</sup> Perte du Rhone was situated near Bellegarde-sur-Valserine, where at low water the River Rhone disappeared into a deep fissure in its limestone gorge bed, beneath which it ran for about 20 km. Lubbock, op. cit., pp. 317-20. Since 1948 the feature has been submerged beneath the accumulation lake behind the Genissiat dam.

With incredible difficulty we reached the upper alpine lake, which also had a beautiful green colour, but was less transparent. But the view across the lake to the south to the hollow of the Zauka Pass was even more picturesque, which was due to the fact that in the lower corner of the upper lake schists were replaced by granites, which rose above its left bank as high and beautiful cliffs, while in the right upper corner of the lake there were visible mountain peaks with patches of perpetual snow. Descending to the lake, we found a convenient place for our bivouac near it on its right, south-eastern side by the very foot of the last rise to the Zauka Pass. I decided to stop overnight here in order to have all the next day at my disposal for the final ascent of the top of the mountain pass, to the lakes which provided the sources of the Naryn, that is the upper reaches of the ancient Jaxartes (Syr-dar'ia), which no-one had before reached.

On 13 June we moved off from our bivouac before sunrise and at first travelled along the southern shore of the lake but, having reached the river flowing into it from the mountain pass, started going up along it at first, and then turning east-south-east, continued our ascent of the mountain along paths which had been laid out in zigzag pattern among the protruding rocks. Our ascent was especially impeded by the fact that on our way we began to come across corpses of animals which seemed quite fresh, and which were lying in the most diverse poses in which sudden death had found them. Among them the most frequently encountered were horses, but there were also quite a lot of camels, sheep and cattle, and twice we came upon human corpses. All of them were excellently preserved since the time of their death (in May) in the icy atmosphere of the upper alpine zone.

Our ascent as far as the mountain hollow leading to the top of the pass took no less than two hours, as one careless step could have cost us our lives. Our horses trod timidly, taking fright before the corpses lying across the path. At one turn my horse, startled by an unexpected encounter with such a corpse, shied aside: I managed to jump off it onto a rock, while it slipped downwards, but held its ground on the precipice, catching onto a projecting rock with its front hooves. Almost at the same time, one of our pack-horses came down with its pack due to a similar fright, fell into the abyss and was smashed to death. We had to stop on the climb, where my saddle was transferred onto a spare horse, and I decided to leave four Cossacks and a Kirgiz at the foot of the pass until the next morning, having charged them with rescuing our baggage by getting it out of the abyss. I myself continued my ascent, accompanied by Kosharov, three Cossacks and two Kirgiz guides, who were leading two pack-horses and a spare one. On the steepest parts of the slope my fellow-travellers had to go on foot and lead the horses by the reins, and towards the end of the slope I myself dismounted and also went on foot; moreover, I was struck by the fact that I had to stop continually, gasping because of the difficulty in breathing thin air at such a altitude.

At last we reached the top of the pass,<sup>1</sup> which presented me with an unexpected sight; there were no longer any mountain giants in front of me, but before me unfolded an undulating plain, from which rose snow clad summits like relatively low hills. Amongst them there could be seen green lakes, only partly covered with ice, and in places where it was ice-free there were floating flocks of beautiful *turpans* (*Casarca rutila*), which were striking in their brilliant metallic red and blue colours, which resembled the colours of birds of paradise.

A hypsometric measurement gave 3,380 metres for the absolute altitude of the Zauka Pass. I began to feel noises in my ears, and I thought that they would immediately start bleeding. However, it turned out alright, and I again mounted my horse in order to climb the nearest, fairly gently sloping summit, from which I was able to view the entire hilly upland and catch sight of several more lakes. Then, having come down from the crest, I continued my journey southwards across marvellous alpine meadows. Luxuriant vegetation covered all the hill-slopes and was adorned with large bright flowers of blue and yellow gentians, pale lilac *kupal'nitsa* (*Hegemone lilacina*), and white and yellow buttercups.

But the most impressive were the extensive glades, everywhere covered with the golden heads of a peculiar and hitherto undescribed species of onion, because of which this whole part of the Tian'-Shan' received from the Chinese the name of Tsun-lin', that is 'the onion mountains'. With pleasure the Cossacks ate their fill of this onion: so delicious did they find it. Besides this type of still absolutely unknown onion, which subsequently received in my honour the species name of *Allium semenovi regel*, on that day I also managed to find another new plant of the genus *Oxytropis*, which later received the name of *Oxytropis oligantha* from the botanist Bunge, who described it.<sup>2</sup>

Having walked for a couple of hours across these marvellous alpine meadows, we climbed another gently sloping snow-covered hill, from whence we saw three more lakes, from which the rivers were already flowing to the southern side of the pass towards the south-east and, merging, formed a bigger river, the high

<sup>1</sup> Kosharov no. 97. Zauka Pass lies at 3,388 metres in the Terskei Alatau, overlooking Issyk-kul'. The river Zauka, originating in perpetual snows near its summit, is some 64 km long and drains to the upper Naryn from an alpine lake, ice-covered for ten months of the year. The pass was already known in the seventh century by the Buddhist missionary Huan-tsang and was used by several nomadic hordes during the era of great folk migrations.

<sup>2</sup> [Semenov:] Here is a complete list of the plants collected by me that day (13 June) at a height of 3,380 metres at the top of the mountain pass, at the watershed between the rivers flowing into the Zauka and the Naryn (that is the Issyk-kul' and the Aral Sea systems). These plants are typical of the high alpine flora of the Tian'-Shan': *Anemone micrantha*, *An. narcissiflora*, *Ranunculus altaicus*, *Ran. gelidus*, *Oxygraphis glacialis*, *Callianthemum rutaefolium*, *Trollius altaicus*, *Hegemone lilacina*, *Isopyrum grandiflorum*, *Aconitum rotundifolium*, *Papaver alpinum*, *Corydalis gortschakovii*, *Draba pilosa*, *Viola gmeliniana*, *Viola grandiflora*, *Oxytropis oligantha*, *Dryadantha bungeana*, *Saxifraga flagellaris*, *Valeriana globulariaefolia*, *Primula cortusoides*, *Primula nivalis*, *Gentiana foliata*, *Gent. aurea*, *Gent. prostrata*, *Gent. kurros*, *Gent. frigida*, *Gymnandra borealis*, *Allium semenovi*.

longitudinal valley of which, making for the west, disappeared in the hazy distance. That was the river Naryn, the upper reaches of the ancient Jaxartes, on the lower course of which (the Syr-dar'ia) Russia was already firmly established. We wandered for another two hours amongst the sources of the Naryn, but I did not dare to descend along its valley: our horses were exhausted and extensively injured.

It was impossible to spend the night at such an altitude, but it was too dangerous to go down into the fairly high Naryn valley, as we might be attacked there by a strong *baranta* of Sultan Tiuregel'dy. That is why, having spent about five hours at the Zauka Pass, I decided to turn back. On the way back, while still at the sources of the Naryn, we met a small, light brown, Tian'-Shan' mountain bear (*Ursus arctos leuconyx*). It certainly found rich pickings for itself on the scene of the fatal fight of the Bogintsy, towards which we headed on our return journey.

The site of this decisive and last battle between the Bogintsy and Sarybagish, according to the views of our guides, should be located a little to the right and to the east of our return route, between the familiar summit which we were ascending, and that plateau edge along which we had climbed up the pass. Pursued by the Sarybagish hot on their heels, the numerous Bogintsy clan had with serious losses climbed the plateau of the Zauka Pass; there, having satisfied themselves that it was impossible to achieve their initial plan to move away to the Naryn, they decided to turn towards the east along paths leading to the Sary-dzhas and Kok-dzhar, and to pick their way to the Karkara to the nomadic camps of their supreme *manap* Burambai, from whom the rebellious clan had separated so thoughtlessly. But it was at this turn that the Bogintsy, weakened by losses during their difficult ascent, were overtaken from both sides by the Sarybagish detachments: of Umbet-Ala, who was pursuing them closely, and of Tiuregel'dy, who had gone around them from the side of the upper reaches of the Naryn. In the open area, to which we came out from the plateau edge nearest to the border of the crest, the fate of the Bogintsy was decided after a last desperate battle. All the animals in their herds and flocks that still had the strength to move were seized by the Sarybagish and quickly driven away by them to the upper reaches of the Naryn, while all that could not move fell in exhaustion on the battle-field, littering it with their corpses. Only those Bogintsy under whom their horses still survived, without turning their heads, galloped away to the east along the paths leading into the high foothill valleys of Tengri-tag, and were not pursued any further by their conquerors, who turned towards the west into the valley of the Naryn with their rich booty.

The day was already drawing towards evening, when, having gone round the foot of the familiar summit, we came out at the 'field of the dead', covered with frozen carcasses, among which there were human corpses too. The impression made upon me by this field was far stronger than the impression of 'the morgue' at St. Bernard.<sup>1</sup> Only here did I feel deeply the poetic address of the great poet

<sup>1</sup> The Great St Bernard Pass was crossed by Semenov in 1854; *Detstvo i iunost'*, pp. 264-5.

Pushkin to a similar glade with the words: 'Oh field, field, who has littered you with dead bones?'.<sup>1</sup>

It seemed to me that something was stirring in front of me on this dreadful field of the dead, and that I could hear some living sounds here. And indeed, as I moved forward across this waste I saw that something stirred in front of me, and, to my surprise, it was not a hallucination. A pack of Bogintsy dogs, which had remained on the battle-field since the spring and which lived there on dead bodies, which due to the cold had not in the least decayed, rushed towards us with joyful barking. These dogs attached themselves to us and remained our faithful companions during the whole of our onward journey until our return to Vernyi.

At about seven o'clock in the evening we turned quickly from 'the field of the dead' towards its northern margins, from which we began to go down along the same path up which we had come. It was already getting dark when from half-way on our descent, down below, at the foot of the pass on the shore of the alpine lake we spotted the lights of the bivouac of our four Cossacks, whom we had left and who were waiting for us, worried about our fate. At the bivouac I found both tea and supper, and my white tent, in which I was able to sleep for about four hours before dawn, having during the night dispatched two Kirgiz to our main detachment, which was waiting for us in the Zauka valley in order to warn them of our return.

On 14 June, already before dawn, we began to go down along the track, familiar to us, past both alpine lakes and further along the Zauka river, and by five o'clock in the morning we had joined up with our main detachment, which we found at the place where we had left it on 12 June, by the last fir-trees at the upper limit of the forest vegetation. The detachment, already warned about our return, had already left their bivouac during the night, and without wasting time we continued our non-stop descent from the Zauka Pass, but this time without that haste with which we had gone down from the alpine lakes to the upper border of the forest zone in order to join our detachment at dawn.

Already before the place of our main detachment's bivouac the schists, which comprised the outcrops of the valley, came to an end, and exposures of crystalline rocks, granites, began. Half-way between our detachment's bivouac and the place of our camp by the Zauka (on 12 June) I noticed also outcrops and screes of diorite porphyry on the left side of the valley. Somewhat lower, after a turn directly southwards, syenites began to appear both as outcrops and in screes.

Further along we were now going through a zone of fir forest, which was dense and rich in moss. Only as we were approaching Kyzyl-dzhar, the coniferous forest thinned out, and the fir-trees gave place to rowan (*Pyrus aucuparia*).

The interesting locality of Kyzyl-dzhar required additional investigation,

<sup>1</sup> This quotation comes from Pushkin's poem *Ruslan and Liudmila*.



which I undertook, not in the least delaying the further descent of the whole detachment to Lake Issyk-kul', by travelling separately from it without baggage but with my Cossack interpreter, the artist Kosharov and three Karakirgiz, who were well acquainted with the old residence of Burambai. Painstakingly, I collected samples of typical, in my opinion, ancient Issyk-kul' conglomerate, of which the entire Kyzyl-dzhar is composed, and checked the extent and dip of its strata. They turned out to be the same as I had observed in another place during our ascent: an orientation from east-north-east to west-south-west, and a dip of  $15^\circ$  to the north. The sample of conglomerate, which became part of the extensive geological collection, which I had made all the way along our route at any new outcrop or change of rock, and which subsequently passed to the museum of the Mining Institute, consisted of red coarse-grained sand, fairly lightly cemented, with boulders of various Tian'-Shan' rocks, which were being brought into the lake by the rivers which feed it. That conglomerate displayed a propensity to have caves formed in it, which I noticed in one of the precipices on the right bank of the Zauka river. One such cave served as a storehouse for the mill in which Burambai ground his grain. The interior of this cave was very sooty. I did not find any inhabitants of the animal world except for two mice, which were feeding on remnants of bread. The floor of the cave sloped in accordance with the dip of the conglomerate of  $15^\circ$  to the north. The most spacious cave was enclosed by a man-made stone fence, cemented with clay. Near the cave were the remains of Burambai's fortifications.

Having completed the additional survey of the Kyzyl-dzhar locality, we quickly set off to catch up with our detachment, which was slowly going down along the road towards Issyk-kul'. We went straight by the ancient ruins across the steppe foothills of the Tian'-Shan', and having caught up with our detachment, by five o'clock in the afternoon we came out to that beautiful lake's bay, into which both Kyzyl-su rivers discharged.

Here we made a halt and, since it was very hot, took it into our heads to swim; moreover, a bay convenient for this purpose struck us by its abundance of fish. Huge wild carp (*Cyprinus carpio*) with their beautiful scales were shining in the sun and splashed in large numbers at the very surface of the water,<sup>1</sup> getting entangled with thick undergrowths of water plants of the family of naiads (*Potamogeton perfoliatus*), their long stems rising from the bottom, with which the bay had become overgrown right to its very middle. We did not have with us any equipment for catching fish, but the Cossacks, entering the water, took their sabres with them and, having drawn them, started slashing the fish, which were entangled in water-plants and splashing on the surface of the water. In approximately two hours this improvised means of fishing gave us up to eleven *puds* of fish, with which we cooked excellent fish-soup for the whole detachment, and

<sup>1</sup> Probably it was the spawning of wild carp (N.G.F.)

pickled the rest, having obtained some salt from the nearest saline through the Karakirgiz. In the bay the temperature of the water was 20.5°C, with the air temperature at 28.5°C. A hypsometric measurement gave 1,370 metres of the absolute altitude for our bivouac on the shore of the bay. We spent the night in the thickets of sea buckthorn and other shrubs on the bank of the Kyzyl-su river.

On 15 June at five o'clock in the morning it was only 9.5°C. Having set out from our bivouac at that hour, in the shortest possible time we came onto the shore of Issyk-kul' itself, to the east of Kyzyl-su bay. I decided to devote the whole day to an exploration of the coastal strip of the lake, and then of the flora, not only of this zone but also of the entire plateau in which the deep basin of the lake was cut. Since on the entire Issyk-kul' there was at that time not a single boat, I could not even think of measuring the depth of the lake, and could only judge it by the Karakirgiz testimonies and by the general character of the hollow, which occupied the longitudinal valley between two gigantic mountain ridges, and which bore a similarity to the hollow of Lake Geneva. As it turned out afterwards, according to information conveyed by V. V. Nagaev<sup>1</sup> in 1892, the depth of the lake was determined to be eighty metres at seven *versts* away from the southern shore, 256 metres at twenty *versts*, and 300 metres at forty-two *versts*; a maximum depth of 425 metres may be reckoned, that is the lake appeared to be the deepest of all the European and Russian lakes, except for Baikal and the Caspian (in 1892 a depth of 702 metres was discovered by L. S. Berg<sup>2</sup> by the southern shore).

I was especially interested in the littoral, which was about 30 to 60 metres wide, and in which I noticed two old shore terraces, parallel to each other, each three metres high. On this coastal strip one could find everything that the waves of the lake, famous of old among the natives for its storms, cast ashore. First of all I examined the boulders and pebbles cast up by the waves, and became convinced that the rivers flowing into the lake from the Tian'-Shan' did not bring any volcanic rocks into it. Then amongst these boulders I found many remains of

<sup>1</sup> One of his ancestors, Admiral Aleksei Ivanovich Nagaev (1704–81), attended the Petersburg Naval Academy and subsequently taught there before being posted to Astrakhan in 1730 for a four-year study of the Caspian Sea. In 1739 he was sent to Reval and compiled hydrographic maps of the Baltic, Lake Ladoga, the river Oka, the mouth of the Kolyma and Bear Island, Kamchatka, the lower Amur and the Bering Sea. He was director of the Naval Cadet College and commanded the port of Kronstadt, founded on his initiative.

<sup>2</sup> L. S. Berg (1876–1950) was one of the most outstanding Russian geographers trained in the closing years of tsardom, but performing enormous scientific service during the Soviet era. Born in Bessarabia, he graduated in natural science from Moscow University in 1898, was sent to investigate lakes on the Omsk district, and embarked on research into integrated problems of climatic, hydrological and landscape processes in Turkestan. He initiated investigations into climatic change in inner Asia, focusing on sea-level changes in the Issyk-kul', Balkhash, Aral and Caspian basins. His most influential works include *Aralskoe more* (1908), *Ob izmeneniiakh klimata v istoricheskuiu epokhu* (1911), *Osnovy klimatologii* (2 vols., 1927 and 1938), *Landshaftno-geograficheskie zony SSSR* (1931), and *Priroda SSSR* (1937). He also wrote histories of Russian exploration and of the Geographical Society. Murzaev, 'L. S. Berg', pp. 1–7; and Berg, *passim*; Pokshishevskii, 'Raboty', pp. 500–508.

fish, and also a significant quantity of shells, bones of water birds and even the bones and tusks of wild-boar. The remains of fish which I found belonged (except for the wild carp) to the species of *marinka* (*Schizothorax pseudaksaiensis Issykkuli Berg*) and *osman* (*Diptychus dybowskii kessler*) from the rivers and lakes of Semirech'e, which were familiar to me and my accompanying Cossacks. And the shells which I collected and later sent to be identified by the zoologist Martens,<sup>1</sup> turned out to be a new species of *limnei*, which he described by the name of *Limnaea obliquata mart.* On this very shore shortly before my journey, the Bogintsy found a copper cauldron, which was very ancient by its form and decorations, and large in size, and some copper weapons, seemingly of the Bronze Age.<sup>2</sup>

The water of the lake here was a beautiful transparent blue, and on the more distant horizon an indigo-blue colour, and it was very salty. The view from the shore, which curved like an arch, of Cape Kara-burun, slightly elevated and jutting out into the lake, and of the main gigantic ridge of the Tian'-Shan', rising above the southern littoral of Issyk-kul' (Terskei), was truly fascinating. Unfortunately, in my exploration of the Issyk-kul' basin I had to restrict myself to a thorough examination of the coastal strip, and then to move on to an exploration of the inland flora of the Issyk-kul' plateau, since any hydrological researches of the lake's basin were out of the question in the absence of a boat. It was only my six outings to various places in 1856 and 1857, and also interrogation of the natives, that convinced me that there were not, and could hardly be, islands in Issyk-kul' of such a type as Aral-dzhol appeared to be in Lake Ala-kul'.

It would be interesting for me to check the Karakirgiz stories about ruins of buildings which had disappeared under the water, and which are to this day sometimes visible during low water level. In confirmation of this evidence the Karakirgiz informed me that they fairly often found bricks and stones, of which the disappeared underwater buildings were made, on the shore examined by me on 13 June. They pointed out to me the place at which they saw these buildings from the coast, which I visited on 14 June, and from the cape which separated the bays of Tiup and Dzargalan. It seemed to me that this place was situated on the underwater continuation of Cape Kara-burun, and in any case on the

<sup>1</sup> Eduard von Martens (1831–1904), son of the botanist Georg Martens (1788–1872), studied medicine and natural history at Tübingen University (1849–52), and in 1859 became curator of the Zoological Museum at Berlin. From 1874 he was Professor of Zoology at Berlin University and in 1887 became second director of the Museum für Naturkunde. His particular research field was in lower life forms, especially molluscs, and he participated in the 1860 Prussian expedition to China, Japan, Celebes, Java and Siam, contributing to the report, *Die preussische Expedition nach Ost-Asien* (2 vols, Berlin, 1865–76). His research on Central Asian molluscs was published in the *Memoires* of the St Petersburg Academy of Sciences in 1881–2.

<sup>2</sup> Semenov notes that later he drew Kaufman's attention to the possibility of searching for these interesting objects in the Bogintsy nomadic camps, and on the latter's instructions they were indeed found and placed in the Tashkent museum which he created. Unfortunately, Semenov did not know what happened to them after the closure of the museum.

eastern, shallow part of the lake, because large quantities of deposits were constantly brought into it.

Irrespective of these buildings which had disappeared beneath the waters of Issyk-kul', there are also some other historical testimonies about islands which existed in Issyk-kul', and which have now apparently disappeared. These testimonies date from the fourteenth and fifteenth centuries. In the fourteenth century, according to the testimony of Arab-Shakh<sup>1</sup>, Timur the Great (Tamerlane) put his distinguished prisoners on an island in Issyk-kul', where he ordered a dwelling to be built for them. In the middle of the fifteenth century, according to the evidence of Muslim historians, one of the Mongol khans founded a fortification on an island in the middle of Issyk-kul' in the Koi-su locality, in which he kept his family for safety. Comparing these three testimonies, I have no reason to doubt their veracity and I come to the conclusion that all three relate to one and the same island, which existed in the fourteenth and fifteenth centuries, and at that time was built on, but disappeared together with its buildings under the waters of the lake since the sixteenth century.

But where could such an island be? Without doubt, in the eastern shallow part of Issyk-kul', as it was not rocky, of the Aral-tiube type in Lake Ala-kul', but alluvial, and in that case it should be referred to the place pointed out by the Karakirgiz at the underwater continuation of Cape Kara-burun. I find confirmation for the fact that the island was alluvial and was surrounded by shallow water in the name of the area of the lake in which the island was, 'Koi-su', which means 'the sheep's water'. The name Koi-su is often encountered in Central Asia and is always applied to such shallow and calm waters which sheep can cross easily. It is, in fact, 'the sheep's ford'. This could only be the water surface surrounding the alluvial island in Issyk-kul' which was formed on the underwater continuation of Kara-burun. It was not particularly difficult for it to disappear with all its buildings under the waves of Issyk-kul' during any severe storm which accompanied one of those earthquakes to which the shores of Issyk-kul' were frequently exposed. Thus the fragments of the buildings, cast on the shore visited by me on 14 June 1857, date not from the Usun-Chinese period (second century), but from the Mongol era (fourteenth and fifteenth centuries).

Having left the interesting shores of Issyk-kul', we used the rest of the day to travel from the coastal area of the lake across the steppe surface of the Issyk-kul' plateau, and having also crossed the river Dzhety-oguz, we came out to the river Dzhangalan, where we stopped overnight, having collected very rich material on the flora of the Issyk-kul' plateau. Moreover, in spite of the comparative poverty of the flora and predominance in it of usual plants of the European-Sarmatian

<sup>1</sup> Akhmed-ben-Mohamed (Arab Shakh) was a fifteenth-century Arab writer, best known for his history of Timur which had been translated and published in Paris in 1658.

and Western Siberian plains,<sup>1</sup> I managed to find a totally new plant of the Central Asian type, of the Scrophularia family, which was later named *Odontites breviflora*.

It rained throughout the night of 15 June at our Dzhargalan camp.

On 16 June at seven o'clock in the morning, when we left our camp at the Dzhargalan, the weather had already improved somewhat, and the thermometer showed 14°Celsius. We came up to the coastal swell and, across slightly undulating and somewhat rising ground, climbed up Tasma, a wide belt separating the parallel courses of the rivers Dzhargalan and Tiup. Having come up to Tasma, we saw the beautiful grave of a Bogintsy folk hero by the name of Nogai who had died at this place in 1842. This memorial, made by the best Kashgar craftsmen, cost Nogai's family quite dear: they paid for it two *iamby* of silver, two camels, five horses and 300 sheep. The memorial looked like a small temple of oriental architecture with a cupola and a tower. In the front wall there could be seen a door in a deep embrasure, while the cupola had had painted over it an extremely crude fresco, on which were depicted Nogai himself on a horse and with a long lance in his hand, and behind him, also on a horse, his son, Chon-karach, and

<sup>1</sup> [Semenov:] Here is a list of these flora, drawn up from notes, supplemented and corrected now after the elaboration of my collection, which was processed by the botanists Regel, Bunge and Herder, and which are kept in the herbaria of the Botanical Gardens: *Clematis songarica*, *Thalictrum simplex*, *Ranunculus acris*, *Aquilegia vulgaris*, *Delphinium caucasicum*, *Berberis heteropoda*, *Glaucium squamigerum*, *Cardamine impatiens*, *Berteroa incana*, *Chorisporea bungeana*, *Sisymbrium brassicae*, *S. sophia*, *Erysimum canescens*, *Capsella bursa-pastoris*, *Lychnis dioica*, *Silene inflata*, *S. viscosa*, *Malva borealis*, *Geranium pratense*, *Peganum harmala*, *Aplophyllum sieversii*, *Rhinactina limonifolia*, *Erigeron acris*, *Solidago virga-aurea*, *Achillea millefolium*, *Tanacetum fruticosum ledinsdorom*, *Artemisia dracunculus*, *Artemisia sacrorum*, *A. vulgaris*, *A. absinthium*, *Senecio vulgaris*, *S. sibiricus*, *S. paludosus*, *Onopordon acanthium*, *Jurinia chaetocarpa*, *Cichorium intybus*, *Tragopogon ruber*, *T. pratensis*, *T. floccosus*, *Scorzonera purpurea*, *S. austriaca*, *S. marshalliana*, *S. tuberosa*, *Taraxacum officinale*, *Convolvulus lineatus*, *C. arvensis*, *Campanula patula*, *C. steveni*, *Chenopodium hybridum*, *Blitum virgatum*, *Oxyria amaranthoides*, *Atriplex laciniata*, *Eurotia ceratoides*, *Ceratocarpus arenarius*, *Rheum rhaponticum*, *Rumex aquaticus*, *Atraphaxis lacti*, *A. lanceolata*, *Polygonum aviculare*, *P. polymorphum*, *P. cognatum*, *Hippophae rhamnoides*, *Euphorbia subamplexicaulis*, *Eu. esule*, *Eu. latifolia*, *Salix fragilis*, *S. purpurea*, *S. viminalis*, *Alisma plantago*, *Orchis latifolia*, *Thermopsis lanceolata*, *Medicago falcata*, *M. lupulina*, *Trigonella polycerata*, *Trifolium pratense*, *T. repens*, *Lotus corniculatus*, *Glycyrrhiza aspera*, *Caragana frutescens*, *C. pygmaea*, *C. tragacanthoides*, *Astragalus hypoglottis*, *A. onobrychis*, *A. buchtarmensis*, *Vicia cracca*, *Lathyrus pratensis*, *L. tuberosus*, *Prunus padus*, *Spiraea hypericifolia*, *Geum strictum*, *Potentilla supina*, *P. bifurca*, *Sanguisorba alpina*, *Rosa platyacantha*, *R. cinnamomea*, *Crataegus pinnatifida*, *Cotoneaster nummularia*, *Cotoneaster multiflora*, *Pyrus malus*, *Galium boreale*, *G. verum*, *Lithospermum officinale*, *Echinosperrum deflexum*, *E. microcarpum*, *Cynoglossum viridiflorum*, *Solenanthus nigricans*, *Hyoscyamus niger*, *Verbascum phoeniceum*, *Dodartia orientalis*, *Odontites breviflora*, *Rhinanthus cristagalli*, *Pedicularis dolichorhiza*, *P. verticillata*, *Origanum vulgare*, *Thymus serpyllum*, *Salvia sylvestris*, *Ziziphora clinopodioides*, *Nepeta nuda*, *Dracocephalum altaense*, *D. peregrinum*, *D. ruyschiana*, *Scutellaria orientalis*, *Lamium album*, *Eremostachys sanguinea*, *Plantago major*, *P. lanceolata*, *Iris guldenstadtiana*, *Juncus communis*, *J. bufonius*, *Scirpus lacustris*, *Carex paniculata*, *C. vulpina*, *C. praecox*, *C. nitida*, *C. nutans*, *C. songorica*, *Hordeum pratense*, *Elymus sibiricus*, *E. giganteus*, *E. junceus*, *Secale cereale*, *Triticum cristatum*, *Festuca ovina*, *F. rubra*, *Bromus erectus*, *Dactylis glomerata*, *Poa altaica*, *Arundo phragmites*, *Calamagrostis erigeion*, *Lasiagrostis splendens*, *Stipa capillata*, *S. pennata*, *Phleum boehmeri*, *Setaria viridis*, *S. italica*, *Andropogon ischaemum*.

further off all the members of Nogai's family and a line of pack-camels. Between the groups there were depicted fantastic trees and even flowers. All the bricks of which the building was constructed were brought from Kashgar. Among them bricks of red colour were somewhat cruder and worse than our Russian bricks, but on the other hand the grey ones were of better quality and were characterized by strength and resonant quality. But the glazed bricks were particularly strong and beautiful, obviously having been collected from ancient ruins. The room inside the building was octagonal and high, about four metres in diameter, but completely empty.

Our further journey across Tasma took another two hours. The soil here seemed much more fertile than at Terskei, and the grasses were richer, but nevertheless they resembled those of the slightly sandy European Russian steppe. Then we saw before us the entire wide valley of the river Tiup, stretching from east to west, and the long bay of Issyk-kul', into which it discharged. The whole of the Zailiiskii Alatau in front of us was covered in dense fog.

Having travelled for half an hour across the valley of the Tiup, we reached the river itself, forded it and came out to the opposite, steep slope across from Dzhantai's grave. This grave was higher and more beautiful in architectural respects than the first one: it had a cupola and two towers, and on the front wall there could be seen the beautiful patterned embrasures of the windows and doors with interesting decorations above. The room inside the building was high, cylindrical, and placed in its middle was a kind of sarcophagus.

Proceeding further from the grave of Dzhantai on the way to Kungei, that is the northern littoral of Issyk-kul', and having crossed the river Vadjpak, we noticed here a few ancient, so-called 'stone images',<sup>1</sup> such as are encountered in the southern Russian (Novorossiisk) steppes, that is all along the trail of migrating nomads from Middle Asia. The local stone images were roughly carved from syenite, deeply dug into the earth and had broad flat faces, albeit male ones with long moustaches. Here we also came upon the 'chudskii' tumuli.

It is obvious that Santash, as well as the space between the Tian'-Shan' and the Zailiiskii Alatau, likewise both shores of Issyk-kul', as also the courses of the

<sup>1</sup> Kosharov no.129 (4). *Kamennye baby* or *balbaly* are ancient anthropomorphic stone statues found in considerable numbers from southern Russia and former Austrian Galicia through southern Siberia and central Asia to Mongolia. They are carved from sandstone, limestone and granite and vary from 0.7 to 3.5 metres in height, averaging 1.5 to 2.0 metres. First noted by a Dutch traveller in the thirteenth century, they were more systematically recorded on the seventeenth-century land surveys where they appeared to be aligned along routes and boundaries. Elsewhere, the statues seem to be associated with *kurgans*, although it remains unclear as to whether they were grave monuments, or indeed from what period and what people they derive. Where they depict facial characteristics their outlines seem to portray Turkic rather than Mongol features, and they have variously been attributed to the Kumans (Polovtsy), Huns, Goths, Tatars, Alans and Scythians. Their dating appears to be equally problematical, and Uvarov believed that in different localities they ranged from the early Iron Age to the early Christian period. Frumkin, *Archaeology*, pp. 38-9.

rivers Chu and Talas served as the most well-worn tracks of migrations of peoples from inner upland Asia, about which the Chinese chronicles have preserved very detailed recollections. As far back as the second century BC. these chronicles tell of nomadic peoples with whom the Chinese were becoming acquainted on the north-western outskirts of the Middle Chinese Kingdom, at the place where its province of Gan-su encroaches upon the Central Asian upland as a comparatively narrow strip, as if extending its hand in order to seize it. The most energetic of the Asiatic nomads readily strove for these north-western outskirts of the kingdom, finding the Achilles' heel of China here, since from here, during the period when the Chinese state was at its weakest, they were able with impunity to batter it with their invasions, taking away with them rich plunder from the Chinese settlements which they ravaged.

The most powerful and dangerous of these nomadic peoples for China during the last two centuries BC were the Huns, who lived here with their subject tribes, the dark Yue-dzhistsi [Yue-chih] of Mongolian type, and the blue-eyed and red-haired Usuns [Wu-sun].<sup>1</sup> In the second century BC, when the state system of China, after a period of weakness, began to re-awaken, the Chinese managed to force the Huns back somewhat, away from the Gan-su entrance into the rich and fertile Chinese plains. The Huns drew back, and in their turn pushed out the Usuns and the Yue-dzhistsi from their nomadic camps, forcing them to retreat to the distant west. First the Usuns moved, and following the northern Tian'-Shan' road (Tian'-Shan'-Bei-Lu), emerged into the basin of the river Ili. The Yue-dzhistsi slowly started moving after them, too. At first they held out still in the vicinity of the Huns, but, defeated by them again, they then ran without looking back with the intention of joining up with the Usuns. At first following the southern Tian'-Shan' road, they crossed to the northern slope of the Celestial Mountains in the meridian of the town of Hami,<sup>2</sup> but having found that this northern slope was occupied by the Usuns, who had gained a firm foothold both in the basin of the Ili and in the Issyk-kul' basin, went ahead past them, turned

<sup>1</sup> For the Mongol *Yue-dzhistsi* (Yueh-chih) and *Usun* (Wu-sun) nomads, and Huns (Hsiung-nu) in Gan-su, see Grousset, *Rise and Splendour*, ch. XIV; Fitzgerald, *China*, pp. 176-89; Frumkin, *Archaeology*, pp. 28-34 and 38-41; Lattimore, *Inner Asian Frontiers*, pp. 489-90; Latourette, *The Chinese*, pp. 108-36.

<sup>2</sup> Hami (Turki Komul) oasis is one of the most important settled localities of Xinjiang province, to the east of Urumchi. It was already known before the Christian era, but was perpetually being overrun. Marco Polo recorded it as part of the Komul state. By the early eighteenth century it had deteriorated appreciably, despite being rebuilt by both Manchurians and Chinese as a fortified base. More recently, it lay on the main transit route from western China to eastern Turkestan along a narrow cultivable belt between untilled steppe and desolate stony desert. Situated at between 700 and 1,900 metres above sea level, the oasis produces grains and fruit, traded from Turfan, with whose fate its historical geography is inextricably linked, to Peking. At the turn of the century the population of the whole oasis was approximately 20,000. *B&E*, 73, pp. 33-5; *Population Atlas of China*. The English travellers Mildred Cable and Francesca French, who passed through the oasis in 1930, stressed its strategic significance, presenting a vivid description of the town and its people in *The Gobi Desert* (1950 edition), pp. 135-45.

aside again southwards and came out to the Jaxartes into ancient Sogdiana,<sup>1</sup> and from there went further to the west into Europe.

The Usuns remained the undisputed rulers of the Issyk-kul' basin for five centuries, and it would seem they must have left behind some monuments, of which one should refer the local stone images, the Bronze Age weapons found here, and generally the most ancient objects among those cast ashore by the waves of Issyk-kul'.

According to the Chinese chronicles, which were always detailed, there were 120,000 families of Usuns, who established themselves in this their second fatherland, while their army comprised 188,000 horsemen. Their country, according to the description in the Chinese chronicles, abounded in excellent pastures and herds, which made up their principal wealth, but it was cold and very rainy, and its mountains were covered with fir-trees and deciduous forests. The Usuns were primarily engaged in horse-breeding: the wealthy ones had more than four, and even five, thousand horses. Although the Usuns were under the supreme dominion of the Huns, all the same they had their own quite powerful sovereigns, who bore the title of *kiun'-mi*. The Chinese readily sought an alliance with these Usun rulers in order to instigate wars, in case of need, in the rear of their powerful enemies. That is why in 107 BC the Chinese Court gave their princess in marriage to the Usun king with the title of *kiun'-di*. The first Chinese palace was built for this queen in the main nomad camp of the Usun king. This royal residence the Chinese called Chi-gu-chin, that is 'the town of the red valley'. This 'red valley', according to the idea which I formed on the spot, could only have been the valley of the Dzhargalan, but in any case Chi-gu-chin was not on the shore of Issyk-kul', but at some distance from it, as is confirmed by ancient Chinese maps, and that was brought about by the need of the Usun rulers to be surrounded by rich pastures and not by water.

A plaintive song of the Usun queen, written by her even before the building of the palace at the end of the second century BC, has been preserved by the Chinese chroniclers. Here is a translation of it:

My relatives gave me in marriage  
And forced me to live in a far country,  
My poor *iurta* serves me as a palace,  
Its walls upholstered with thick felt.

<sup>1</sup> Sogdiana was an ancient territory in the basins of the rivers Zeravshan and Kashka-dar'ia, its people speaking a language close to the middle Iranian (Yagnobi) group of Indo-European. Its main town was Marakanda, later known as Afrasiab, near present-day Samarkand. The earliest state nucleus seems to have emerged at least by the end of the sixth century BC but was repeatedly deluged by neighbouring Chinese, Persians and Kushans. It flourished most under the Turkic feudal khanate from the sixth century onwards, when agriculture, towns, crafts and colonization focussed on Semi-rech'e. Trade between China, Mongolia, Iran and Byzantium played a key role, both economically and culturally, before it fell to Arab invasions in the eighth century. Fitzgerald, *China*, pp.178-9.



## THE HEART OF THE TIAN'-SHAN'

Raw meat is my food,  
And sour milk is my drink.  
My senses long for my fatherland,  
And my heart is deeply wounded.  
Oh, if I could be a little bird of passage,  
How quickly would I fly there.

But already during the reign of the queen's grandson, by the name of Ud-zyty, the kingdom became divided into bigger and smaller portions, and the temporary capital of Chi-gu-chin was abandoned for ever.

Undoubtedly, what contributed most of all to the fall of the Usun state was the fact that the Huns, gradually forced out by Chinese policies from the vicinity of the province Gan-su and from Tangut, also moved away to the west and found for themselves a second fatherland in Dzhungaria, having subordinated all the nomads who lived between the Tian'-Shan' and the Altai, and who belonged mainly to the Eastern Turkic tribes (Tu-kiue). Chinese chroniclers vigilantly observed the movements of their enemies, gathering detailed information about them, but at the beginning of our era they had already lost sight of them, contenting themselves with a final statement that they had left for Sikhai, that is 'the western sea', by which the Chinese historians meant the Aral-Caspian basin. It appears that the Chinese Huns, according to the testimony of their chroniclers, could not have gone to the west by any other route from Dzhungaria but that through the present-day Kirgiz steppes and across the river Ural into the Trans-Volga region, where for the first time the European Huns became known in the basin of the river Itil (Volga), which apparently gave its name to the famous Attila. Only the Asiatic Huns came into Europe from their second fatherland, not solely in their tribal composition, but as an agglomeration, composed of various tribes of nomads who lived between the Tian'-Shan' and Altai, and who recognized the political dominion of the Huns. By no means all these tribes followed the Huns, and many remained on the beautiful pastures of Dzhungaria; instead of them, during their further movement the Asiatic Huns carried away peoples whom they came upon on their way, mainly Finnish tribes.

Chinese chroniclers mention the Usuns as far back as before the beginning of the fourth century AD. Forced out of their Tian'-Shan' nomadic encampments at that time by the wave created by the great movement of the Huns, they fled partly to the south-west towards the upper Jaxartes and Trans-Oxiana, and partly to the north-west into the Kirgiz steppe, where they submitted to Turkic tribes (Tu-kiue), who had moved there, became mixed with them in unions, which in comparatively modern times received the name of Kirgiz-Kazakhs, and since then have now disappeared from the theatre of history. It is obvious that one should look for the remains of the Usuns among the tribes of the Karakirgiz and

Kirgiz of the Great Horde, among whom on the one hand I met from time to time blue-eyed and red-haired people, and on the other hand, there survived the word 'Usun', by which the Kirgiz of the Great Horde designate two of their clans, but the Sarybagish - one of *their* clans. It is clear that no monuments, besides those stone images and some bronze weapons, could have survived from the nomads who lived here before the beginning of our era, but on the other hand the nature of the Trans-Ili region and the Tian'-Shan' foothills has here and there preserved its typical features, which were noted so well by the Chinese two thousand years ago.

To resume my narrative, we used the whole day of 16 June for exploration of the vast steppe plateau which separates the Tian'-Shan' from the Zailiiskii Alatau eastwards of Issyk-kul', and in which were incised not very deeply the longitudinal, parallel valleys of the main tributaries of the lake, the Dzhangalan and Tiup, divided from each other by a gentle ridge which had the name of Tasma, and then we made our way to the northern littoral of Issyk-kul', Kungei, in which I was interested no less than in the southern one, Terskei.

Beyond the Badpak-kara rivulet, where we came upon the ancient stone images, we now reached Kungei, whence there opened up before us a view of Issyk-kul' with Cape Kok-kulusun, which juts out into it, and with two transparent blue bays. Unfortunately, by four o'clock in the afternoon, at a temperature of 14°C, it started pouring with rain, and having reached the river Kurmenty, we came down along it to the bay into which it discharges, and settled here for the night among thickets of sea buckthorn and willow.

It poured with rain during the whole night of 16-17 June, and from two o'clock in the afternoon it began hailing heavily. Only by half past nine in the morning of 17 June did the weather clear up completely, and we came out, having passed by Kurmenty Bay, to the shore of Issyk-kul', at the place where from this shore there opened up that truly enchanting view to the south-west along the lake's basin, which was 170 *versts* long and fifty-five *versts* wide, and from which the entire continuous snow-white series of the Tian'-Shan' giants seemed to rise from the boundless indigo-blue surface of the lake. From here the artist Kosharov made some pictures,<sup>1</sup> partly in pencil, partly with oil-paints, when the waves dashing against the shore had not yet had time to calm down after the storm.

The character of the coastal strip at Kungei turned out to be the same as it was at Terskei: a terrace one metre high, and between it and the water level there was a wide sandy belt, onto which the surf of the waves deposits pebbles, boulders, shells, bones of fish and water birds, and objects that belonged to people who lived on the shores of Issyk-kul'. Among the latter I searched in vain for what interested me most of all. During my stay in Venice in the early fifties, on the

<sup>1</sup> Kosharov no. 66.

famous Catalan map<sup>1</sup> which was preserved there, I had seen for the first time a picture of Issyk-kul', and on its northern side there was depicted a monastery of the Nestorian Christians,<sup>2</sup> who, as is well known, had fled from the countries of the Near East (Syria, etc.) into the heart of Asia and established their monastery in the twelfth century on the shore of Issyk-kul'. It is obvious that, if this monastery was on Kungei, the monks who had founded it could have chosen a place for that purpose on the shore of one of the numerous bays of Kungei, which was protected from the lake's choppiness and was rich in fish. Kurmenty Bay quite suited these conditions, but unfortunately I did not find any objects which would have justified my supposition, either on its shore or in its adjacent littorine deposits.

Having enjoyed wandering around the lake's shore for about half an hour and having collected a few more interesting shells (incidentally, two types of *Planorbis*, *Pl. marginatus* and *Pl. limophilus*), we turned to the place where the river Kurmenty made its exit from the mountains and walked along the track across the field, pointed out to us by our guides, of the memorable battle in which there had died the *manap* Urman, famed among the Karakirgiz. He was mortally wounded by Klych, Burambai's son, with a lance thrust, which penetrated right to the heart. Urman died in the *iurta* of Kodzhigul, Burambai's cousin, in the arms of his daughter, who came galloping to him, and who was formerly married to Emirzak, the second son of Burambai. Up to 6,000 horsemen from both sides took part in the battle, and in spite of Urman's death, the Sarybagish gained total victory. That was as far back as 1854, and since then, up to my arrival in 1857, the Bogintsy had lost all their Issyk-kul' domains, stretching over the middle of the lake both in Terskei and in Kungei, and had moved away to Santash.

During my long talks with the Karakirgiz about the battle I had an opportunity to question them about the character of the Issyk-kul's winters. From these inquiries it turned out that the lake never freezes over, but that winters tend to be cold there, and although it snows very little, nevertheless the small bays of the lake which are not affected by the movement of the waves become covered with ice.

From the exit of the river Kurmenty from the mountains we used two or three

<sup>1</sup> This reference provides the first indication that Semenov had seen the Catalan map in Venice during his visit in 1854. The map was painted *circa* AD 1375 by Abraham Cresques for the King of Aragon; the 8-panel wooden 'atlas' is now preserved in the Bibliothèque nationale, Paris. Skelton, *Explorers' Maps*.

<sup>2</sup> Nestorian Christianity developed from the heretic Nestorius, born in Caesarea Hermaniki on the Euphrates. He was deposed as Patriarch of Constantinople in AD 431, and his followers in eastern districts of the Antioch patriarchate were forced to move to Persia, where they were welcomed as refugees from hostile Byzantium. The sect subsequently spread to Middle Asia, the Malabar Coast of India, and China. When Persian rulers adopted Islam in the seventh century the Nestorians preserved their rites as a protected religion, but under Tamerlane they were heavily persecuted and few groups survived in central Asia. The possibility of a twelfth-century Nestorian monastery on Issyk-kul' was thus quite conceivable.

hours to go over the spur of the Zailiiskii Alatau, which separates the exits of the parallel rivers Kurmenty and Shaty from the mountain, and having reached the latter, we turned northwards up along its valley in order to explore it to the very top of the mountain pass leading through the Kungei-Alatau here.

We went up the Shaty valley for about an hour before we reached the first fir-trees and settled ourselves in a bivouac amongst the thick vegetation at the foot of the syenite rocks at three o'clock in the afternoon. The Cossacks set out to pitch my tent and to pick up *tezek* (*kiziak*, that is dung) for making a fire and cooking food, while I, with a botanical capsule over my shoulder and geological hammer in my hand, went immediately on foot up the mountain in order to reach the alpine zone more quickly.

The vegetation of the mountain slope was luxuriant. Above the fir-trees there also grew mountain shrubs: strong *archa* (*Cotoneaster nummularia*), meadow-sweet (*Spiraea oblongifolia*), sweetbrier (*Rosa gebleriana* schr.) and red-currants (*Ribes rubrum*), partly inter-twined with mountain clematis (*Atragene alpina*). There also appeared some mountain plants, which did not grow on the shores of Issyk-kul', namely, yellow *Aconitum lycoctonum*, Himalayan *Anemone falconeri*, Altai peas (*Lathyrus altaicus*) and broad-leaved Himalayan rhubarb (*Rheum emodi*).

But I wanted to get to the alpine zone somewhat quicker, and hence having caught sight of a high mountain crest directly above me, obviously going beyond the borders of the forest zone, after two hours of ascent, I climbed it, encountering alpine vegetation on it, as I had expected. Of Ranunculaceae, I collected here a delicate white buttercup (*Callianthemum rutaefolium*), bright yellow alpine buttercup (*Ranunculus altaicus*), a beautiful *Anemone narcissiflora*, and *kupal'nitsa* (*Trollius patulus*); of Cruciferae, *Chorispora bungeana*; of Leguminosae, a type of astragal (*Oxytropis platysema*); of Rosaceae, *Potentilla fragiformis*; of Compositae, large-flowered *Scorzonera austriaca* and a fiery-coloured *Erigeron uniflorus*; of primroses, *Primula algida*, *P. nivalis* and a graceful light purple *Soldanella alpina*; of Labiatae, *Phlomis alpina*, and so on.

To my utter delight during that excursion (on 17 June) I also managed to find two new species: one astragal, which later received the name of *Oxytropis oligantha* from the botanist Bunge, who described it, and the other from a lovely family of primroses (Primulaceae), which typified the spring and alpine plants and which later received my name, *Cortusa semenovi*, from the botanist Herder, who described it.

The view from this crest was fascinating: the immense dark blue lake spread out at the foot of the mountain on which I was standing, as on a relief map, and beyond it there arose the continuous snow chain of the Celestial Mountains without any breaks or dark patches. The mountains appeared to be especially spectacular beyond the south-western end of the lake, where the whole row of snowy summits seemed to be emerging directly from the indigo-blue surface of

the lake. I was so carried away by the marvellous sight and by collecting high alpine herbs that I did not notice that it was already getting dark in the deep Shaty valley and that I would not get to the valley before nightfall.

Quickly I began my descent, which was not easy, however, because although the steep slope was covered with marvellous grass of the alpine meadows, it was very damp and slippery. I was coming down not in a zigzag but along a diagonal, directed at the bottom of the valley towards the bivouac, the lights of which were already clearly visible to me. Soon I noticed another living creature, moving with me in the same direction. It was a bear which was coming down along a diagonal too, but directed not at the bottom, but at the top of the valley and therefore crossing my diagonal much lower than at the place where I was. Only here did I remember that I had left my revolver in the tent, and that I had no other weapon except for my hammer. It was necessary to avoid an encounter with the bear and for that reason to work out which one of us would be the first to reach the place of intersection of both paths. Since I was closer to that place, without wasting time, I continued my descent and crossed the bear's path when it was only a hundred steps away from me.

Continuing my descent very quickly, I turned around, however, in order to take a look at the bear's descent. Having reached the place of interception of the paths, the bear stopped, sniffed at my tracks and looked at me, but did not turn onto my path, and, not pursuing me, went on his way along his own route, having considerably speeded up his descent and amusingly somersaulting at steep places. Now, at last, I could calm down. Given the huge height of the slope, the paths intersecting each other should have diverged by at least a whole *versta* at their exit into the valley.

My descent into the valley took no less than an hour, but I kept the lights of my bivouac in view, and by the time I reached the bottom of the valley, it was already pitch dark. Running up to the camp, I was met by my fellow-travellers, who were already very worried about me. Having had my supper and some tea, I went into my tent and by the light of my lamp, which consisted of dry dung stuck into a huge lump of fat from a sheep's tail, wrote in my diary and packed up my treasures, collections of the rare plants of the Trans-Ili alpine flora, in blotting paper.

On 18 June, having awoken with the dawn in the valley, we moved off from our bivouac and began to go up the Shaty valley. Having crossed to the left bank of the river, we went near a small spring, going steeply up the mountain in a zigzag, partly over somewhat marshy ground, partly over huge boulders of syenite, but having traversed this hill-side, we came down again into a mountain valley where the gradient was no longer so steep, and came into a dense fir forest, mixed with rowan-trees. Higher up this forest became thinner and was replaced by shrubs, which consisted mainly of juniper (*Juniperus sabina*). Then the junipers disappeared too, and there appeared wonderful alpine meadows with those flowers, the majority of which I had already collected the day before on that

crest where I encountered the bear, but among them I also noticed a countless number of wonderful large-flowered Altai violets (*Viola grandiflora*) and white Edelweiss (*Leontopodium alpinum*).

So we came to the top of the pass, for which a hypsometric measurement gave 3,140 metres. The air temperature was only 2°, and the whole slope of the pass was covered with snow. From here Kosharov and I and another Cossack went up another mountain, which was rising like a cap one or two hundred metres above the pass, as I wanted my companion to see and draw the delightful and even more extensive view than the one that I had seen from my mountain crest the previous day. We came down the mountain pass very quickly, and after resting at a bivouac in the lower part of the valley, we came out to the Kungei and then turned very abruptly eastwards across the undulating ground which separates the exits of the rivers Shaty and Tabul'gaty from the mountains, but here, having crossed the river Taldy-su, up to which we still came upon outcrops of syenite, we unexpectedly ran across a *baranta*.

We were going fairly fast up one of the steep slopes which were beyond the river. Our Bogintsy guides were galloping some distance ahead of us, as suddenly I noticed that they had turned back quickly and in fright, warning us of some kind of danger. I spurred my horse and galloped towards that danger, and following me all the Cossacks, of whom there were altogether fifteen in this excursion, galloped too. When I came up to the steep slope, I saw the Sarybagish *baranta* of about thirty people, pursuing two of our Bogintsy guides. All of them had their *turkhi* (flintlock rifles with their characteristic protuding small support spikes) slung over their backs. It was already impossible for us to pass one another. I again spurred my lively horse, and it carried me into the middle of the gang; however, I just had time to prepare my revolver, famous among the Karakirgiz. The Sarybagish horsemen at once stopped and turned back their horses, dexterously jumped off them, and having taken their guns off their shoulders, put them on the ground. I also stopped my horse. At that time those who had fallen behind me were already drawing near. I thought that the Karakirgiz were going to put their guns on the spikes in order to get ready to shoot, but leaving their weapons on the ground, they announced to us that they surrendered. Thus, when we came up to them, totally unexpectedly we turned out to have up to thirty prisoners on our hands. I told them that since I had never had any hostile intentions towards them, I set them free, but on one indispensable condition, that they return home and on no account go on *baranta* against the Bogintsy, and as a guarantee of carrying out my demands I would keep with me two hostages, whom I would set free on my return to Burambai. The Sarybagish were very pleased and hurried to gallop away home, and the two *amanats* joined my detachment as guides.

By the evening we reached the river Tabul'gaty, turned to the north into its valley, went up along it, and having reached the forest zone, settled there for the night in a beautiful fir-tree grove. It rained all night.

The 19 June was one of the most successful days of my journey. By nine o'clock in the morning the weather had cleared up completely, and we began the exploration of the interesting valley and the climb up the high Tabul'gaty Pass, about which however we were told that it was easier than the Shaty one, which I had just explored. Near our camp the vegetation of the forest zone had already a mountain and even sub-alpine character, but further on, with the disappearance of the forest vegetation, it gradually became alpine. With a thorough investigation of the change of this vegetation from the forest zone into the alpine one that day, I was able to discover six absolutely new species of plants; four while still in the forest zone, and two in the alpine zone. These plants later received the following names: one of the family of Fumariaceae was given my name, *Corydalis semenovi*; the second, of the astragal species of Leguminosae was named *Oxytropis heteropoda*; the third, of the Umbelliferae, was named *Peucedanum transiliense*; the fourth, also Umbelliferous, was a new, hitherto unknown species, which was given my name of *Semenowia transiliensis*; the fifth, of the Compositae family, was named *Tanacetum transiliense*; and finally the sixth belonged to the family of Liliaceae and was named *Orithyia heterophylla*.

That day I collected many plants in the forest and alpine zones. Of those collected in the forest zone:

- i) four species turned out to be absolutely local in their geographical distribution, as they were newly discovered;
- ii) five species were already found earlier in Altai and partly in Tarbagatai – *Sanguisorba alpina*, *Lonicera hispida*, *Rhinactina limonifolia*, *Dracocephalum imberbe*, *Tulipa altaica*;
- iii) seven species were spread across the entire Altai-Saian upland – *Lathyrus altaicus*, *Libanotis condensata*, *Aronicum altaicum*, *Saussurea salicifolia*, *Dracocephalum altaicense*, *Salix sibirica*, *Festuca altaica*;
- iv) five species were widespread in the same Altai-Saian system, but moreover are also found in the Caucasus – *Anemone narcissiflora*, *Potentilla fragiformis (gelida)*, *Ribes atropurpureum*, *Aster alpinus*, *Doronicum oblongifolium*;
- v) two species were typically Arctic Siberian, transitional to America and rising up the Asian mountain ranges – *Potentilla pensylvanica* and *Bupleurum ranunculoides*;
- vi) nine belonged to European-Siberian Arctic species, climbing the Asian and partly also the European mountain ranges – *Papaver alpinum*, *Moehringia lateriflora*, *Cerastium alpinum*, *Saxifraga hirculus*, *Erigeron alpinus*, *Oxyria reniformis*, *Carex frigida*, *Eriophorum chamissonis* and *Phleum alpinum*;
- vii) eleven species belonged to the quite usual forms of our European-Russian Poles'e and were widespread in Siberia too – *Prunus padus*, *Spiraea oblongifolia*, *Geum rivale*, *Alchemilla vulgaris*, *Pyrus aucuparia*, *Androsace villosa*, *Poligonum bistorta*, *Salix viminalis*, *Carex praecox* q., *Veratrum album*, *Poa nemoralis*;

viii) finally, three species turned out to be Russian steppe ones, reaching the Zailiiskii Alatau across the Asian steppes – *Nepeta nuda*, *Dracocephalum nutans*, *Tulipa sylvestris*.

Going up the valley, we reached the boundary of the forest vegetation in about two hours, and then the top of the pass before two o'clock in the afternoon. Here I made a hypsometric measurement, which gave 2,750 metres of absolute altitude. The thermometer was showing 7.5°C at that hour. At the pass, starting with the boundary of the forest vegetation, I made an extremely interesting collection of alpine plants. Of thirty-one species of plants collected by me in the alpine zone of the Kurmenty Pass, there were:

- i) two local ones, newly discovered that day (19 June);
- ii) one also local, found by me a few days before in Tian'-Shan' – *Allium semenovi*;
- iii) five Himalayan forms – *Anemone falconeri*, *Oxytropis kashmiriana*, *Sedum coccineum*, *Gentiana kurros*, *Rheum spiciforme*;
- iv) one species was found before that by Karelin only in Tarbagatai and by me in Tian'-Shan' – *Oxytropis frigida*;
- v) two species were found before that by the botanist Bunge only in eastern Altai by the river Chu and by me in Tian'-Shan' – *Hegemone lilacina*, *Dracocephalum imberbe*.

The rest of the alpine species of the Kurmenty Pass have a wider distribution, namely:

- vi) six species across the entire Altai-Saian system – *Ranunculus altaicus*, *Callianthemum rutaefolium*, *Thermopsis alpina*, *Chrysosplenium nudicaule*, *Primula cortusoides*, *Gymnandra borealis*;
- vii) five more species reach as far as the Caucasus, as well as this mountain system, too – *Erysimum cheiranthus*, *Viola grandiflora*, *Saxifraga sibirica*, *Primula nivalis*, *Androsace villosa*;
- viii) finally, four more species reach the Arctic plains of Asia and Europe – *Lychnis apetala*, *Astragalus alpinus*, *Gentiana aurea*, *Pedicularis versicolor*.

When we reached the summit of the Tabul'gaty Pass that day, all of its northern slope was covered with snow, but this snow was fresh, fallen in recent days; in those places where it was melting, there were visible patches of perpetual snow. The crest itself and the slope from it to the southern side consisted of granite. Between two and three o'clock in the afternoon we quickly began to descend, and at two thirds of this slope granites were replaced by limestones.

I began an investigation of these limestones from the line of their contact with the granites, and soon I was lucky enough to discover in them a sufficient number of beautifully preserved fossils, which gave me the opportunity to determine, beyond any doubt, the era of the formation of the Palaeozoic strata of the sedimentary formations so widespread in the Zailiiskii Alatau and Tian'-Shan'.



I camped for the night in the valley of the river Kurmenty at the lower boundary of the forest zone, which according to my hypsometric measurement was at 1,820 metres of absolute altitude. Our successful day ended with a hearty supper, in the form of two sheep supplied for our whole detachment from the nearest Bogintsy *auly*, which had moved forward in the wake of our advance along Kungei.

On 20 June with fine weather and a temperature of 7.5°C, I got up at five o'clock in the morning and hurried to use three hours for a most thorough collection of fossils at the outcrops of the mountain limestones which were rising above us.<sup>1</sup> We moved off from our camp at nine o'clock in the morning and, having come out to the Kungei, after a few hours we reached the wide valley of the river Tiup, which at that time was luxuriantly covered with arboreal and herbaceous vegetation. Of arboreal plants there were growing: bird-cherry (*Prunus padus*), apple (*Pyrus malus*), meadow-sweet (*Spiraea hypericifolia*), *argai* (*Cotoneaster nummularia*), *cherganak* (*Berberis heteropoda*), and willow (*Salix viminalis*). Here on the beautiful pastures of the valley of the river Tiup we found Bogintsy *auly*, and having changed our horses in them, by the evening we had already reached the *auly* of Burambai, who had prepared for us the most cordial reception.

My expedition to the shores of Issyk-kul' and the inner Tian'-Shan' up to the sources of the Jaxartes, as well as the visit to Kungei, returned to Burambai all his domains in the Issyk-kul' basin, the remains of his residence in the Zauka valley and a multitude of the Bogintsy captured by the Sarybagish, while the alliance with Sultan Tezek ensured his safety for a long time. There still remained on his mind only two insistent desires.

The first was to the effect that I was to ask the Sarybagish *manap* Umbet-Ala, who was already my '*tamyr*', in writing to return to Burambai all the female prisoners of his family at whatever ransom he assigned. A very good opportunity to do this presented itself to me. I immediately gave back their freedom, weapons and horses to the two Sarybagish who had been taken hostage by me when receiving surrender of the Sarybagish *baranta*. I instructed them to deliver immediately to Umbet-Ala my letter, to which I received a reply just after my second visit to the inner Tian'-Shan'.

The second, and the most pressing, request of Burambai was that I should assist him to receive Russian citizenship with all his tribe and all his domains, which included all the eastern half of the Issyk-kul' basin and all the northern foothills of the Tian'-Shan' up to the eastern snows of the highest summit of the

<sup>1</sup> [Semenov:] Here is the list of these fossils: of Brachiopoda, *Productus semireticulatus*, *Pr. cora*, *Pr. striatus*, *Pr. giganteus*, *Spirifer mosquensis*, *Pr. glaber*, *Orthis resupinata*, *Rhynchonella acuminata atripa* of a large size, which had not been described up to now; of Cephalopoda, *Orthoceras sp.*; of bivalve shells, *Allorisma regularis* and *Pecten sp.*; of univalves; *Euomphalus pentangulatus*; of corals; *Camphophyllum giganteum*, *Lithostrotion philippi*, *Chaetetes radians*. All these fossils are characteristic of mountain limestones of the Carboniferous system.

entire Celestial Range, Khan-tengri. To this request of Burambai I replied that I was prepared to plead both with the Governor-general and in the Russian capital for his tribe to be granted Russian citizenship, but that for that it was first necessary for me to complete my acquaintance with his domains. That is why I intended now to go within the borders of his summer nomadic camps at Mus-tag towards the upper reaches of the river Kok-dzhar and Sary-dzhas, about which I had already received information by interrogating the Bogintsy, who once led a nomadic life there. Burambai agreed with pleasure to my suggestion, thinking that all the lands which I was going to visit would be confirmed in his tribe's possession. However, he warned me that his enemies, the Sarybagish, never went to the places of their summer camps at Sary-dzhas, because it was too far from their own camps and they were afraid of being cut off from them, as they had cut off the Bogintsy clan, which had separated from Burambai, and which wanted to move over to the river Naryn.

My equipment, which took three days to assemble, was excellent. With Burambai's help I hired, at a cheap price, seventy fresh horses, ten camels and six guides. As in all my travels of 1857, I had no food provisions other than rusks, baked for me in large quantities on Peremyshl'skii's orders while I was still staying in Vernoe, and in addition tea and sheep's tail dripping. We found sheep everywhere we encountered Kirghiz *auly*, and whenever possible took them alive.

On 24 June we left Burambai's *auly* at Malaia Karkara at our full strength so as to penetrate the unknown heart of the Tian'-Shan' in the direction of Khan-tengri, the highest of its giants, for the second time, and, if possible, to cross the watershed of the rivers of Dzhungaria, which belong to the systems of the river Ili and Lake Balkhash and of Kashgaria or Malaia Bukharia, which belong to the system of the river Tarim and Lake Lob-Nor. We had to climb the Tian'-Shan' along the river Bol'shaia Karkara, which belongs to the Ili system.

After two hours of our journey we reached the outlet of the Bol'shaia Karkara from the mountains and turned into its valley, along which we travelled unhindered for an hour and a half in the foothills of the Tian'-Shan'. The valley was covered with good fir forest, while the outcrops which we met consisted of limestones, and then of granite. Having reached the Bol'shaia Karkara's division into two branches, we went along the left one, but its valley became so narrow and turned into a gorge, difficult of access, that our guides warned us that it would be impossible for our sizable detachment with the camels to go through the gorge, and that it was necessary to go round it over the mountains by the track along which the Bogintsy usually went with their herds and flocks to their nomadic camps. This circuitous route was called Sart-dzhol, that is the road of the Sarts.<sup>1</sup>

<sup>1</sup> Sarts, the name given to indigenous sedentary inhabitants of towns and settlements in Syr-dar'ia and parts of Fergana and Samarkand districts. Towards the end of the nineteenth century they numbered some 0.8 millions, or just over one-fourth of the total population of Turkestan. It has been suggested that the term, in use at least since the thirteenth century, may have been a derogatory nickname



PLATE X. Zauka Pass in the Tian'-Shan' (no. 97)

PLATE XI. Northern shores of Issyk-kul' (no. 66)



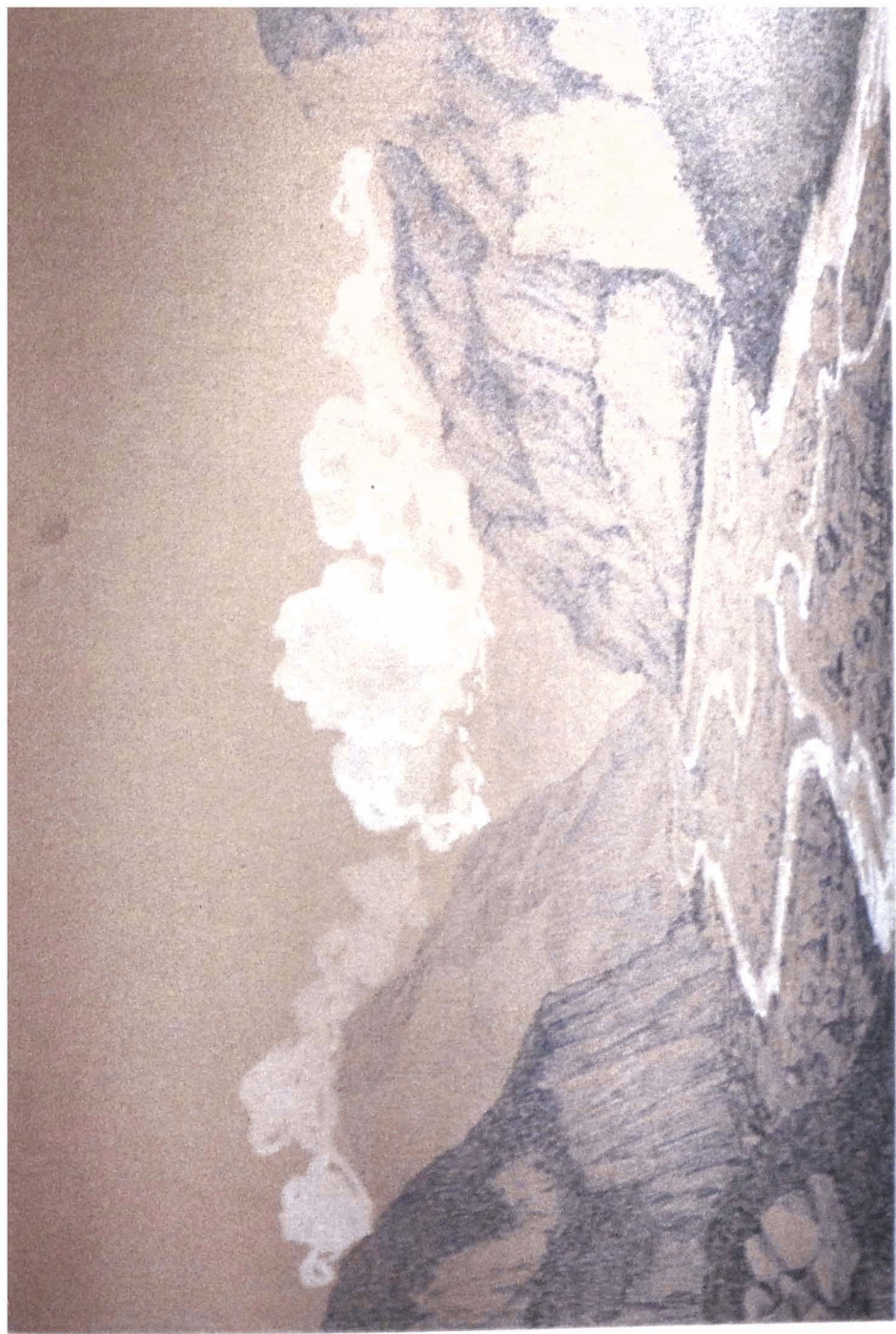


PLATE XII. Kok-Dzhar valley (no. 110)

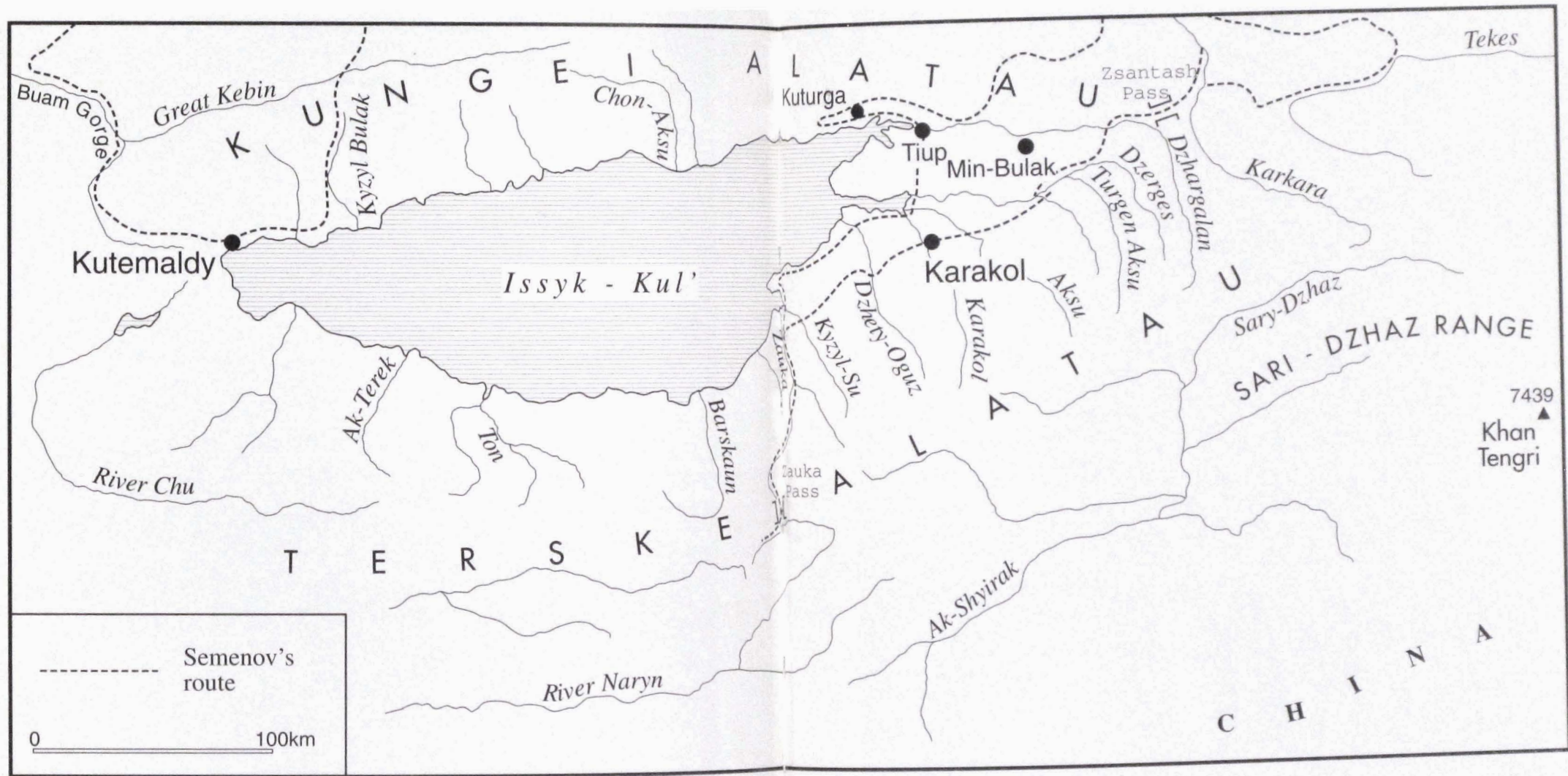


FIG. 4. Second expedition: 'the heart of Asia'



PLATE XIII. The Khan-Tengri group (no. 137)

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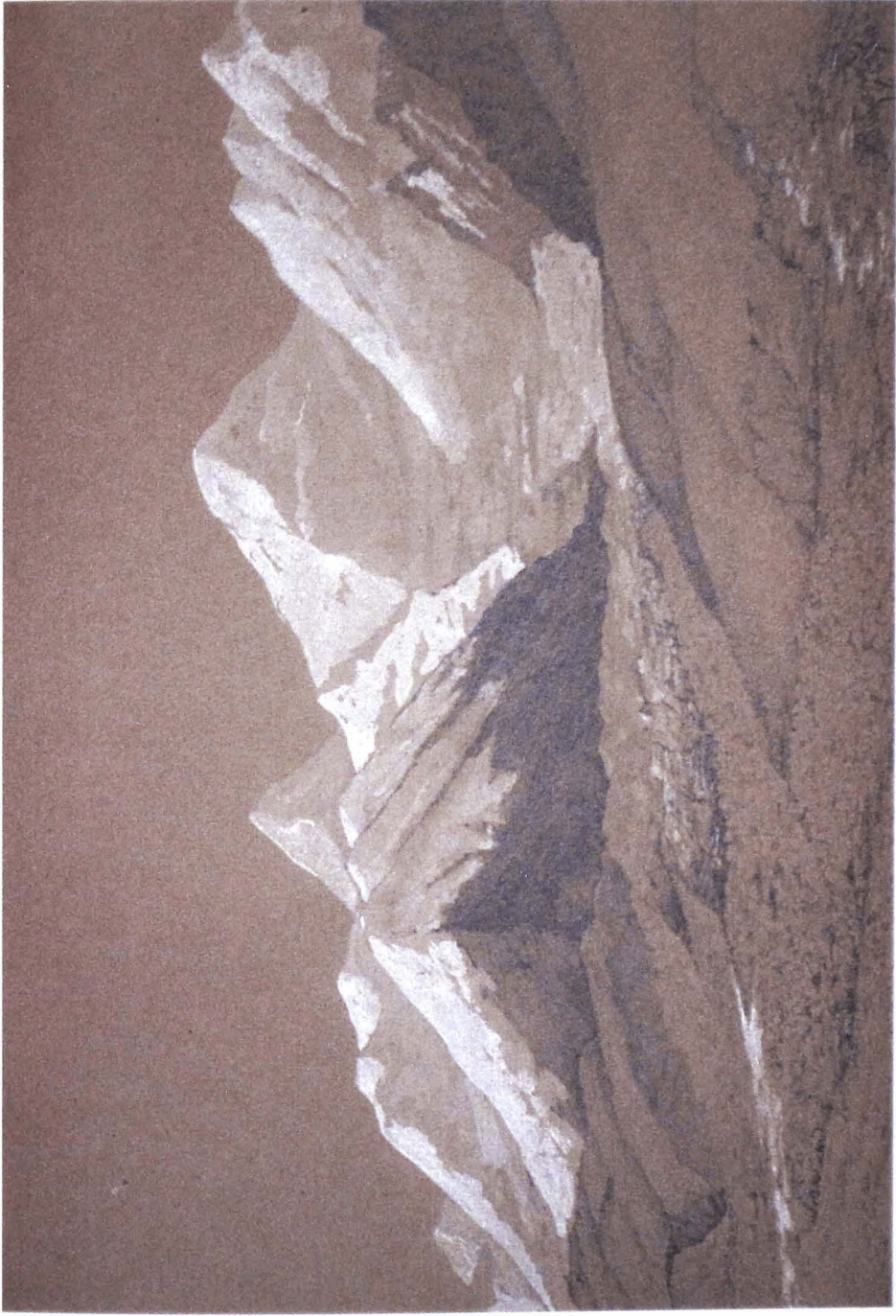


PLATE XIV. General view of the Sary-Dzhas glacier at an altitude of 9000 ft (no. 136)





PLATE XV. Valley of the river Chulyshman (no. 88)

Climbing steeply up the mountain along the track, at first we were still travelling in the forest zone through the fir trees, but then we reached the boundary of the forest vegetation and came out onto marvellous meadows, characterized by alpine and sub-alpine vegetation and which served as summer camps for the noble Bogintsy of Burambai's clan. It was towards the *aul* of one such Boginets of 'blue blood', Baldysan, who had chosen an excellent place for himself for his summer camp, on account of the illness of his mother who needed the mountain air, that we made our way, having turned off the Sart-dzhol across the luxuriant alpine pastures.

I spent three enjoyable hours in the meadows of the sub-alpine zone collecting plants,<sup>1</sup> among which that day (24 June) I was able to find one new species of astragal, later named *Oxytropis ochroleuca* by the botanist Bunge. We reached Baldysan's *aul* by four o'clock. Baldysan, who received me especially cordially on Burambai's recommendation, represented a type of Karakirgiz Sybarite. Peace-loving by nature, above all he valued his own peace of mind; he did not participate in the bloody strife of Bogintsy against Sarybagish, he never went on *baranta* and liked to roam in those places of the Tian'-Shan' which were the most inaccessible to the forays of the Sarybagish. His inclinations were artistic. He loved music passionately and was considered to be the very best Karakirgiz musician on the *dombra* (a stringed instrument like a *balalaika*) and enjoyed listening to the songs of folk-tale narrators and improvisors, sometimes spending whole nights in this pursuit.

With special pleasure, at my invitation, Baldysan played the *dombra* in front of me, called on the bards of *byliny* (traditional heroic poems), who sang these *byliny* very monotonously to the sounds of the *dombra*, and also improvised before me some songs, in which, according to my Cossack interpreters, they glorified my expeditions to the shores of Issyk-kul' and to the sources of the Naryn, which had made the Sarybagish flee from the lands of the Bogintsy. When I returned with my inseparable Cossack interpreter, and the artist Kosharov into the *iurta* which was prepared for me, there appeared in his picturesque costume

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applied to them by the nomadic Uzbeks. Ethnographically, they represent a mixture of ancient Iranian elements with those of later Turkic-Mongol invaders. *B&E*, 56, pp. 449-51; Weekes, *Muslim Peoples*.

<sup>1</sup> [Semenov:] Here is a complete list of plants collected by me that day on the circuitous route (Sart-dzhol) in the forested sub-alpine and partly alpine zone of the Tian'-Shan': *Thalictrum simplex*, *Parnassia laxmani*, *Thermopsis lanceolata*, *T. alpina*, *Medicago platycarpa*, *Caragana jubata*, *Oxytropis ochroleuca* n.sp., *Cicer songaricum*, *Lathyrus pratensis*, *Hedysarum obscurum*, *Potentilla viscosa*, *Pyrus sorbus*, *Ribes atropurpurea*, *Saxifraga sibirica*, *Lonicera hispida*, *L. karelini*, *Inula rhizocephala*, *Gnaphalium leontopodium*, *Senecio sibiricus*, *Crepis sibirica*, *Hieracium vulgatum*, *Primula cortusoides*, *P. nivalis*, *Cortusa matthioli*, *Gentiana prostrata*, *G. aurea*, *Polemonium caeruleum*, *Myosotis sylvatica*, *Pedicularis dolichorhiza*, *Ziziphora clinopodioides*, *Picea schrenkiana*, *Juniperus sabina*, *Allium semenovi*, *Luzula communis*, *Juncus bufonius*, *Carex paniculata*, *C. nitida*, *C. nutans*, *Hordeum pratense*, *Elymus sibiricus*, *Brachypodium pinnatum*, *B. schrenkianum*, *Bromus erectus*, *Dactylis glomerata*, *Poa altaica*, *Avena pubescens*, *Phleum boehmeri*.

and tall hat of swan's-down, with tambourines in his hands, a *duana*,<sup>1</sup> that is a soothsayer, or shaman, as the Siberians call them, since the Karakirgiz, like the Kirgiz of the Great Horde, had the relics of shamanism smouldering under the cloak of Islam, which had not taken deep root.

After some customary frenzied leaps, the *duana* brought himself into a prophetic trance and started to foretell my future. According to his desultory words, which were translated to me by the Cossacks as best as they could, he foretold that I would become an *ul'kun-tiure* (a great dignitary) of the Tsar and would have a hundred ranks (or decorations), which, judging by his gesticulation, he saw on me 'with his own eyes', after which, every time he saw me with a new honour, he fell down at my feet in such exhaustion that finally he fainted.

Of course, at that time I attached no importance to the *duana*'s predictions. I did not even think about ranks and decorations, as I was just thirty years old and had not thought of entering government service, caring only for my scientific interests, especially of the explorations in Inner Asia, planning a new journey to the place where Przheval'skii was later sent with my help.

Having spent the night in great Asiatic comfort with my hospitable host, I took my final leave of him in the morning of 25 June; however, he conveyed to me his wish that when I returned to Russia I would take him there at his own expense, as he wished so much to hear Russian music.

We left at six o'clock in the morning that day and made for the Sart-dzhol, along which we came down into a zone of fir forest and through it came again into the upper part of the valley of the Bol'shaia Karkara.<sup>2</sup> This part of the valley, situated above the wild gorge in which the river forces its way through the frontal chain of the Tian'-Shan', and which we had had to circumvent along the Sart-dzhol, for a length of about ten *vershs* still retained the character of a narrow transverse valley with a steep gradient, but the forest vegetation in it had now disappeared. But from everywhere along the steep precipices, partly overgrown with shrubs, there protruded rocks consisting at first of granite, and later of syenite. After two or three hours of ascent along this transverse valley we came out to a wide and high one, longitudinal with respect to the direction of the ridge, that is stretching from east to west. In this longitudinal valley the two branches of the Karkara merged: one flowing from the west, and the other from the east. The first keeps the name Karkara, while the second, i.e. the one flowing from the east, has the name Kok-dzhar owing to the colour of the rocky precipices which are found along it (Kok-dzhar means 'green ravine').

The Kok-dzhar valley,<sup>3</sup> along which we proceeded, having turned directly to the east, was one of the typical alpine longitudinal valleys of the inner Tian'-

<sup>1</sup> The *duana*, sketched by Kosharov, nos. 20 and 23 (published in Lincoln, *Semenov-Tian-Shan'skii*, opposite p.192).

<sup>2</sup> Kosharov no. 92.

<sup>3</sup> Kosharov nos. 74, 110 and 112.

Shan'. Its average altitude was no less than 2,760 metres; all of it lay above the boundaries of the forest vegetation and across the steep slopes of two parallel ridges, between which it stretches in a direction straight from east to west; it was covered only with alpine shrubs, and partly with both sub-alpine and alpine grasses, which come down from the limits of the eternal snows of the Kok-dzhar ridge.

The rock outcrops which we came across in the Kok-dzhar valley consisted of strata of greenish schist, set edge-wise with a dip of 85° to the north and with an orientation directly from east to west, in accordance with the direction of the wide and high longitudinal valley.

For want of trees, the alpine shrubs decorating the valleys were in full bloom at that time of the year (25 June). They were *Potentilla fruticosa*, dotted with bright yellow flowers; two beautiful species of meadow-sweet with bunches of white flowers, *Spiraea oblongifolia* and *Sp. laevigata*; grey-green tamarisk, the delicate verdure of which intermingled with a mass of beautiful bright pink flowers (*Myricaria daurica*); two species of the light green dwarf willows (*Salix sibirica* and *S. nigricans*); dark green, sometimes semi-arborescent, Cossack juniper (*Juniperus pseudosabina*), and finally, thorny *tiuie-uiriuk* (*Caragana jubata*), with thick grey foliage and pale yellow flowers, which resemble a camel's tail and served as a favourite delicacy of our camels.

For twenty *versts* we went along the Kok-dzhar valley, which, owing to the character of its vegetation, constituted beautiful summer nomadic encampments for the Bogintsy owners of the country, along the course of the Kok-dzhar, which was wide but not swiftly flowing, until we reached its confluence with the river Tuz-kok-dzhar, which got its name from a salt spring nearby. We turned towards this source since a salt spring<sup>1</sup> in the Tian'-Shan' represented an interesting phenomenon for me as a geologist. In the Tuz-kok-dzhar valley the source was on the left side of the river, in the flat valley bottom, where it emerged from the sandy-argillaceous bedrock, forming a basin a metre and a half deep. The water, saturated with a solution of sodium chloride, had a temperature of 18.5°C.

We arrived by three o'clock in the afternoon, and I contemplated staying here for the night, but was not able to realize my intention, because in this part of the valley the forage was very poor, in consequence of which there did not appear to be any fuel, that is dung, either. That is why we had to return to the main valley of the Kok-dzhar, where by five o'clock we found a convenient place for our overnight halt at the foot of a slope leading to the Kok-dzhar Pass,<sup>2</sup> which was famous among the natives, and which serves as the main watershed between the basins of the river Ili and Lake Balkhash on one side (the Dzhungarian) and the river Tarim and Lake Lob-nor on the other (Kashgar) side.

<sup>1</sup> Kosharov no. 133 (3).

<sup>2</sup> Kosharov no. 126 (1).

I used the evening for packing the rich booty of plants which I had collected in the Kok-dzhar valley,<sup>1</sup> amongst which there turned out to be two absolutely new ones, which later received the names of *Cirsium semenovi herd.* and *Deschampsia coelerioides reg.* A hypsometric measurement gave 2,740 metres for the absolute altitude of our camp, and therefore also of the longitudinal valley of the Kok-dzhar; the air temperature was 8.5°C at six o'clock in the evening.

On 26 June it was only minus 2.5°C at sunrise. My tent had become covered with ice, and puddles were coated with thin ice. We went upwards along the main Kok-dzhar, at first towards the south, and then began to turn gradually towards the south-west, since the river broke up into several branches, each of which became somewhat low in water. Along one of them we began ascending the mountain ever more steeply. The outcrops which we encountered consisted of schists stretching towards the end from east to west and with a dip of 90°. Further our path went by a majestic cliff, which consisted of light bluish limestone, and which was rising as an absolutely sheer wall above our path.

However, when we reached the top of the pass by about one o'clock in the afternoon, we were dazzled by an unexpected sight. Directly southwards from us there arose the most majestic of the mountain ranges I had ever seen.<sup>2</sup> All of it, from top to bottom, consisted of snowy giants, of which I could count no fewer than thirty to my left and to my right. This whole range, together with all the spaces between the mountain summits, was covered with an unbroken sheet of perpetual snow. Right in the middle of these giants there arose one snow-white pointed pyramid, which stood out among them sharply by its colossal height, and which from the height of the pass seemed to surpass the altitude of the rest of the peaks two-fold. And indeed, since, according to the latest measurements, the Khan-tengri peak has an absolute altitude of about 7,000 metres, its relative height above the mountain pass was 3,500 metres, while the height of the rest of the mountain summits above the pass did not exceed 2,000 metres. The sky was

<sup>1</sup> [Semenov:] Here is a list of these plants: *Anemone narcissiflora*, *Pulsatilla albana*, *Ranunculus cymbalariae*, *R. hyperboreus*, *R. gelidus*, *Callianthemum rutaefolium*, *Trollius patulus*, *Eutrema alpestre*, *Viola grandiflora*, *Lonicera hispida*, *Lonicera microphylla*, *Galium verum*, *Aster alpinus*, *Erigeron uniflorus*, *Tanacetum ledebourii*, *Gnaphalium leontopodium*, *Saussurea pygmaea*, *Cirsium semenovi n. sp.*, *Allium schoenoprasum*, *A. obliquum*, *A. atrosanguineum*, *Eremurus altaicus*, *Luzula campestris*, *Juncus communis*, *J. bulbosus*, *J. bufonius*, *Eriophorum chamissonis*, *Arenaria rupifraga* (*Coryomorfa*), *Cerastium alpinum*, *Linum perenne*, *Geranium saxatile*, *Caragana jubata*, *Hedysarum polymorphum*, *Onobrychis sativa*, *Spiraea oblongifolia*, *Spiraea laevigata*, *Alchemilla vulgaris*, *Potentilla supina*, *P. pennsylvanica*, *P. multifida*, *P. bifurca*, *P. recta*, *P. fragiformis*, *P. fruticosa*, *Myricaria davurica*, *Carum indicum*, *Archangelica decurrens*, *Schrenkia vaginata*, *Alfredia acantholepis*, *Androsace villosa*, *A. septentrionalis*, *Onosma simplicissimum*, *Thymus serpyllum*, *Phlomis spectabilis*, *Dracocephalum nutans*, *Dr. altaicense*, *Eremostachys sanguinea*, *Oxyria reniformis*, *Polygonum viviparum*, *P. bistorta*, *P. polymorphum*, *Euphorbia alata*, *Eu. subamplexicaulis*, *Salix sibirica*, *S. nigricans*, *Juniperus pseudosabina*, *Carex stenophylla*, *C. paniculata*, *C. atrata*, *C. nigra*, *C. frigida*, *C. praecox*, *C. nutans*, *Hordeum pratense*, *Elymus sibiricus*, *Brachypodium pinnatum*, *Poa alpina*, *Avena pubescens*, *Deschampsia coelerioides*, *Ptilagrostis mongholica*, *Phleum alpinum*.

<sup>2</sup> Kosharov nos. 133 (1), 137 and 144.

absolutely cloudless on all sides, and only on Khan-tengri<sup>1</sup> was there visible a small cloud, which surrounded the mountain pyramid, dazzling in its whiteness, like a light crown a little below its summit.

The entire mountain group of Tengri-tag was visible along its majestic length, and in front of it, at our feet, there flowed the river Sary-dzhas, which did indeed, according to the testimony of our guides, belong to the system of the Central Asian river Tarim, flowing parallel to the Tian'-Shan' on its southern side into Lob-nor. Surprisingly, the river Sary-dzhas originated not on the southern, but on the northern, side of the Tian'-Shan', from the many glaciers which were widely developed on the northern slope of the Tengri-tag. Gathered from these sources, the river flowed majestically along the wide longitudinal valley of the Tian'-Shan', at first straight to the west, then diverging to the south-west and later to the west, bursting gradually into the gorges of the lower Tengri-tag and, having gone round it, forcing its way through the Tian'-Shan', finally emerging on its southern side in Chinese Turkestan (Kashgaria). There, having joined the other major Tian'-Shan' river, the Ak-su, it carried its waters into the Tarim. A hypsometric measurement gave 3,510 metres for the absolute altitude of the Kok-dzhar Pass and therefore for the Tian'-Shan' watershed; the temperature at the pass at one o'clock was 9.5°C, and the vegetation was high alpine.

I stayed at the pass for three hours, not only to admire the majestic view, the like of which one could hardly meet anywhere in the world, but also to orientate myself in the orography of the highest Tian'-Shan' mountain group, to which the local inhabitants have so appropriately given the poetic name of Tengri-tag ('the Range of the Spirits'), likening these snow peaks to the heavenly spirits, and the giant which crowns them and overwhelms by its grandeur – Khan-Tengri, that is the emperor of these heavenly spirits. It is from here that the Chinese name for the entire mountain system, Tian'-Shan' (Celestial Mountains), originated.

At about four o'clock in the afternoon we began to descend the pass to the south and soon reached a stream which was flowing now into the Sary-dzhas. During our descent this stream joined another one and after many meanderings it reached the Sary-dzhas. It was not far from its mouth that we halted for the night. The Cossacks put up my tent by the stream itself, which was discharging into the Sary-dzhas not far from there, and which therefore belongs to the most central of the Asiatic continental basins, that of the Tarim and Lob-nor. Clouds had already begun to cover the snow peaks, but I still had time to enjoy the wonderful sight of 'the Alpine glow' (*Alpenglühén*) on Tengri-tag.

Only when the last rays, illuminating with their pink brilliance the majestic 'tsar of the spirits' (Khan-tengri), were extinguished did I retire into my tent and, by the dim light of my lamp, sorted out the botanical treasures which I had collected that day. Among them were two absolutely new species, which later

<sup>1</sup> Kosharov nos. 119 and 120.

received the names of *Cirsium nidulans* and *Cortusa semenovi*. In all, there were fifty plants collected by me that day.<sup>1</sup> Of these fifty high alpine plants, thirty could be considered natives of the Trans-Ili territory and Semirech'e, that is old Dzhungaria, but four of them reach as far as the Himalayan range, five as far as the Altai, and seven spread across the entire Altai system. The remaining twenty species also cross into Europe; to be exact, ten belong to European Arctic forms, and ten to European high alpine ones found in the Caucasus.

During the night of 26–27 June a snow-storm broke over us.

On 27 June at five o'clock in the morning, on coming out of my tent, which was snow-bound, I found that those sleeping not far from me under a large *koshma* (Kirgiz thick felt) were literally buried under a snow-sheet. Two or three of them had already got out of their snowy burrows and were merrily helping their friends to get out from beneath the snow-bound felt under which they had settled the previous night. However, the temperature was higher than yesterday's. The Celsius thermometer showed 3°, and the snow melted rapidly under the rays of the southern sun. The Cossacks dispersed in different directions to collect fuel; however, one of them, while digging up melting snow within the bounds of our bivouac, came upon an object which made a very sad impression upon us. Under the snow there turned out to be the corpse of a Boginets, carefully wrapped in thick felt and dressed in a robe, underclothes and boots. This corpse was perfectly preserved in the atmosphere of the ice zone. Beyond doubt, it was one of the Bogintsy who had fled the battle-field at the Zauka Pass in May 1857. Wounded or having lost all his strength in the battle, he had reached the Sary-dzhas with his friends, and, having ended his life here, he had been carefully wrapped in thick felt and left under the snow cover.

Having drunk our tea, we already moved off from our bivouac by six o'clock, crossing the Sary-dzhas in order to undertake the ascent of the snow ridge rising on its southern side, to reach the everlasting snow and to measure the height of the snow-line on the northern slope of Tengri-tag. The river Sary-dzhas,<sup>2</sup> to the bank of which we soon came, struck me by the milky greenish-white colour of its water, obviously fed by glaciers.

The river crossing was hampered not so much by its swiftness, which was not

<sup>1</sup> [Semenov:] Here is the list: *Anemone micrantha*, *Ranunculus cymbalariae*, *R. altaicus*, *R. gelidus*, *Oxygraphis glacialis*, *Callianthemum rutaefolium*, *Hegemone lilacina*, *Isopyrum grandiflorum*, *Papaver alpinum*, *Corydalis gortschakovi*, *Viola gmeliniana*, *V. grandiflora*, *V. biflora*, *Lychnis apetala*, *Cerastium trigynum*, *Astragalus brachyotropis*, *Sedum coccineum*, *Saxifraga flagellaris*, *Gentiana aurea*, *G. prostrata*, *G. decumbens*, *Pleurogyne carinthiaca*, *Myosotis sylvatica*, *Eritrichium villosum*, *Veronica ciliata*, *Pedicularis amoena*, *P. rhinantoides*, *P. versicolor*, *Parrya stenocarpa*, *Draba pilosa*, *D. lactea*, *D. stellata*, *Taphrospermum altaicum*, *Thlaspi cochleariforme*, *Hutchinsia pectinata*, *Chrysosplenium nudicaule*, *Richteria pyrethroides*, *Cirsium nidulans* n. sp., *Taraxacum steveni*, *Primula nivalis*, *Cortusa matthioli*, *C. semenovi* n. sp., *Oxyria reniformis*, *Allium alataviense*, *A. semenovi*, *Carex atrata*, *C. stenophylla*, *C. nigra*, *C. frigida*, *Ptilagrostis mongholica* [*Stipa mongolica*].

<sup>2</sup> Kosharov no.140.

excessive, as by the multiplicity of its branches and the deep potholes found in some of them. Nevertheless, our crossing with the camels was accomplished safely, although it took rather a long time. However, I myself gained a lot of time by having left the whole detachment on the river bank at the crossing and having set out without baggage to climb with Kosharov, three Cossacks and two Kirgiz.

The slope from the longitudinal valley, which was up to 3,000 metres of absolute altitude, was accessible for our horses, which were unusually accustomed to mountain climbs. Moreover, our guides, with the quick-wittedness characteristic of the mountain Karakirgiz, took us by the shortest and easiest route towards the nearest patches of perpetual snow. The vegetation on the slopes up which we were climbing was high alpine. The ascent turned out to be very steep, but after about three hours we reached a point where the diminishing steepness no longer prevented us from seeing the snow summits. Only rock debris made the track very difficult for us. They were not new deposits, but sharp large stones deeply embedded in the soil and protruding from it, perhaps the remains of an old moraine.

At last we reached the snow patches, and then began to climb over solid snow, but this snow was newly fallen during the previous night and was covering small expanses of perpetual snow. Here, having climbed onto a summit, accessible for our horses, which was covered with everlasting snow on its northern slope, I made a hypsometric measurement, which gave 3,950 metres, which represented both the height of the snow-line on the northern slope of the Tian'-Shan' and the highest point which I had reached on this ridge. Since it was two o'clock in the afternoon and there was still enough time, I asked my guides to help me to descend to the Sary-dzhas as close as possible to the place where this river cuts into the mountains by a wild and inaccessible gorge, which one must circumvent over the high mountain pass.

We took about an hour and a half to descend diagonally towards the Sary-dzhas, which we reached between three and four o'clock, and came out to it at the place where the Karakirgiz, travelling from the nomadic camps of Burambai to Semirech'e, make their second overnight halt. From here I sent one of my Cossacks up the Sary-dzhas towards our detachment with instructions concerning the place for our overnight stop, while I decided to go down the Sary-dzhas for another two hours or more in order to see from where the roundabout track separates from the Sary-dzhas and where this river enters the gorge.

During these two hours of descent I was able to obtain as detailed information as possible the about the entire route from Burambai's nomadic camps at Santash to that town of Semigrad'e to which this way led, namely Turpak. The guides told me that the road to Kashgaria, on which we were, was the only convenient one in the area between the Zauka and Musart mountain passes. From the nomadic camps of Burambai to the town of Turpak they took seven days. The first night was spent at Kok-dzhar, near the place where we had stayed the



night of 25–26 June. They spent the second night, having crossed the difficult Kok-dzhar Pass, at the Sary-dzhas at the place which we reached that evening. On the third day they climbed along the track which went around the gorge through which the Sary-dzhas forces its way, to the Kuiliu Pass, crossed it and spent the night on its southern side. The crest of the pass is always covered with snow, but under this snow there is ice, as apparently the track went across a glacier, slipping from one of the summits of Tengri-tag. However, my guides considered the crossing of this pass to be less high and less difficult than that of the Kok-dzhar Pass. They spent the fourth night at Ishigart, a quite low pass, seemingly over the southern foothills of the Tian'-Shan'. The fifth night they spent at the river Cholok, and for the sixth they settled overnight within sight of the Chinese guard-post, which was situated in front of Turpak. Onto the Kuiliu Pass, beside the road going through the Tian'-Shan' watershed between the rivers Kok-dzhar and Sary-dzhas, in the majestic Kok-dzhar Pass there emerges another route too, which crosses the Tian'-Shan' watershed between the upper reaches of the river Turgen, the Ak-su and Sary-dzhas, but which was considered difficult in my time.

That was all that I was able to discover about the routes which went round the impassable Sary-dzhas gorges and which led into Kashgaria. Then, when the day already began to draw towards evening, we turned back up the Sary-dzhas and reached the camp of our detachment already quite late at night. The night was warmer than the previous one, and no snow fell.

On 28 June at five o'clock in the morning the Celsius thermometer showed 5°. We started on the journey between five and six o'clock. That day I wished to make my way to the sources of the Sary-dzhas, originating in the glaciers which were coming down into the side valley of the Tian'-Shan'. From the longitudinal Sary-dzhas valley in which we were, we had to go up along the course of the river for about another two hours at first, and then, having moved away from it and climbed the mountain, to cross diagonally a mountain spur, which is skirted by the river-bed. In approximately three hours we came out again to the Sary-dzhas, but by now in that upper part of its course<sup>1</sup> where it was still issuing from the transverse valley, into which there flowed together its sources which originated in the glaciers coming down from Tengri-tag.<sup>2</sup> I made for one of them which seemed to me to be the largest and which blocked the transverse valley, leaving to its right two very beautiful glaciers, which were coming down to the south-west into a side valley, which had a width of about three *verst*s.

We walked along the bottom of the valley, which was strewn with boulders. The predominant rock among them was beautiful white and grey marble. There was undoubtedly more of it here than around the Temple of Vesta in Tivoli near

<sup>1</sup> Kosharov no. 63.

<sup>2</sup> Kosharov no. 126 (3).

Rome. Among the boulders were to be found argillaceous, siliceous, and light grey, shiny micaceous schists,<sup>1</sup> and frequently crystalline rocks – granites, gneisses and syenites, but there was no volcanic rock at all, just as there was not in the entire area of the Tian'-Shan' which I had seen to date.

All along the valley we came upon the skulls of mountain sheep with their enormous curled horns strewn in huge quantities. These skulls were so heavy that a strong Cossack lifted them only with some difficulty. They were very different from the mountain sheep, *arkharii* (*Argalis – Ovis argali*), which are widespread in Altai and other Asiatic high mountain ranges. The natives call the sheep which we found, *kochkari*. This breed of colossal mountain sheep was characterized and described for the first time by the famous thirteenth-century Venetian traveller, Marco Polo. His countrymen did not believe his descriptions and called him 'il milione', that is the teller of tales from the *Thousand and One Nights*. Only in the first half of the nineteenth century did Lieutenant Wood,<sup>2</sup> an English traveller who penetrated into the Pamirs, find there skulls with horns which corresponded exactly to those described by Marco Polo, and it was from these descriptions that British zoologists established Marco Polo's sheep as a new animal, which was named *Ovis poli* in honour of the famous Venetian, but added it to the species of animals which had become completely extinct in historical times, like the so-called sea cow (*Rhytina stelleri*).

We travelled upwards along the wide valley for about three hours and finally began to cross it diagonally, making for a spur jutting out into it from our left side, to which we walked for two more hours, having crossed the Sary-dzhas onto its right bank. The spur ended as a steep cliff, which we reached by four o'clock in the afternoon. Here I stopped my whole detachment with camels and packs for a day's rest, since I wanted to devote the rest of the day to an ascent of the edge of the valley, which rose steeply above us, and from there to see in all its magnitude the glacier for which I longed, and to devote all of the next day, unencumbered with baggage, to a close examination of the glacier itself and of the upper part of the valley.

As soon as our extensive caravan stopped for its prolonged day's rest, Kosharov and I, accompanied by two Cossacks and two Kirgiz, set off upwards across the valley, to which the steeply rising mountains, crowned with perpetual snow, came close on our left side. Soon we began to climb up its steep slopes along a path which was hardly discernible, and here an unexpected encounter was in store for us.

Along a path, going higher than ours, but parallel to it, one might say almost

<sup>1</sup> Kosharov no. 130 (2).

<sup>2</sup> John Wood (1811–71) joined the East India Company in 1826, rising to the rank of naval lieutenant. In 1836 he was assistant to the Afghan trade commission under Sir Alexander Burnes, by whom he was highly regarded following his geographical survey of the Kabul valley. Wood published *A Personal Narrative of a Journey to the Source of the Oxus*, London, 1841. *DNB*, XXI, pp. 835–6.

above our heads, within distance of a good gun-shot, there was passing a large herd of mountain sheep, which our Bogintsy greeted with the cry: 'Kochkar, kochkar!'. And, indeed, I was able to make out through my binoculars that they were huge rams with those characteristic horns, the skulls of which we kept finding in great numbers in the Sary-dzhas valley. Thus, I was delighted to be able to confirm that the semi-legendary *Ovis poli* still existed and was able to gather some biological facts about it from the Karakirgiz, who were familiar with its style of life.

The alpine pastures on the slopes of Tengri-tag are so vast and rich in marvellous grasses that this same breed of huge mountain sheep has a very free and untrammelled life. Moreover, such alpine pastures at an absolute altitude of no less than 3,000 metres, extend as a wide strip, although broken here and there by deep gorges, from the slopes of Tengri-tag to the Pamirs (the Roof of the World),<sup>1</sup> to which they freely run up from here, leaping over precipices, where possible, or going down into them with their characteristic vaults, throwing themselves from sheer rocks with their heads down and falling harmlessly onto their indestructible horns, the clatter of which frequently breaks the silence of the mountain gorges.

From the place of our interesting encounter we were able to orientate ourselves well among the Sary-dzhas glaciers. Beyond the wide valley we saw clearly two more beautiful glaciers,<sup>2</sup> descending picturesquely into a short valley, which was transversal with respect to our path. On the foothills of the two separate groups of snow *belki* of Tengri-tag one could clearly distinguish the snow-white *firn* expanses, which initiated the glaciers, the rocky beds of their lateral moraines, and finally their dirt-coloured extremities. But we were interested most of all in that glacier which blocked off our valley and was majestically descending from the extensive *firn* fields of Tengri-tag, falling eventually as a steep ledge into our valley. Kosharov sketched this glacier particularly carefully from the eminence on which we were.<sup>3</sup>

It was beginning to get dark when we started climbing still further up the mountain in order to enjoy from an even greater height the indescribable sight of

<sup>1</sup> The Pamir mountain system averages almost 6,000 metres in altitude over its 300 km length. The name seems to have been first used by the seventh-century Chinese traveller Huan-tsang: some scholars have derived it from the mythical mountain of Mera, centre of the world in Indian cosmography, while others relate it to the Sanskrit *mir* (sea or lake) or the Persian *bam* (roof), hence 'Roof of the World'. As such, it attracted explorers from ancient times, not least because of its extreme inaccessibility and harsh environment. Nineteenth-century explorers of the Pamir included Fedchenko, Mushketov, Severtsov, Grum-Grzhimailo, and Grombchevskii from the Russian side, and pundits from British India, followed by Forsyth, Elias, Lockhart, Younghusband, Bonvalot, Curzon and Hedin. Among the features of this essentially very arid region which have been investigated are the residual glaciers and their deposits, which suggest that precipitation in the past was considerably greater than in recent centuries. Rickmers, 'The Pamir Glaciers', pp. 217-20.

<sup>2</sup> Kosharov no. 141. For the dynamics of the Tian'-Shan glaciers, see Pal'gov, *Zhizn' odnogo lednika, passim*, and Zabiroy, *Nekotorye zakonomernosti*, pp. 16-29, 39-53, 61-74, and 85-129.

<sup>3</sup> Kosharov no. 136.

'the Alpine glow' (*Alpenglühén*) of the Celestial Range, when the whole extensive valley had already become covered by night, but the snowy peaks of Tengri-tag, with its majestic king, Khan-Tengri, at its head, were still shining with their ruby colours in the rays of the sun, which was already invisible from the valley. When at last this magic twinkling also began to fade, we came down into the embrace of the night to the welcoming lights of our bivouac. The night which we spent here near the glacier of the Sary-dzhas, which later received my name, was not particularly cold: at nine o'clock in the evening the thermometer showed 8.5°C.

On 29 June I got up at five o'clock in the morning and set out without baggage, accompanied only by Kosharov, three Cossacks, two Bogintsy guides and one pack-horse, in the direction of the main glacier, which we soon saw directly in front of us. It was coming down from an enormous group of peaks of Tengri-tag, like a wide, suddenly frozen torrent, which was given, according to Alpine terminology, the name of ice sea (*Mer de glace*).<sup>1</sup> Its lower part, which descended into the valley, was accompanied by a high ridge of lateral moraine, while the snout of the glacier was characterized by its colour, which resembled that of blackened marble statues. It was to this extremity that I came, having crossed its frontal moraine.

The icy mass which made up the extremity of the glacier was about 100 metres high. The type of needle-shaped fracturing, which I used to notice in the ice of the Alpine glaciers with which I was familiar, was not discernible in it, and although small bubbles could be seen here and there, nevertheless the composition of the ice was so dense that when I was breaking a block off it, my hammer rang upon it as on a rock. From beneath the glacier one of the mountain sources of the Sary-dzhas was breaking out with force. A hypsometric measurement of the extremity gave 3,220 metres.

I turned to the right from the glacier snout<sup>2</sup> in order to come out to its left moraine,<sup>3</sup> which rose as quite a high ridge. The moraine contained large boulders too, but for the most part consisted of small stones. In places this moraine came so close to the glacier that I was able to climb up the glacier itself, on the surface of which I came upon large rocky boulders on ice supports, so-called 'glacier tables'.

The further I moved up the glacier, the more frequently I came upon deep fissures, at first so narrow that it was possible to cross over them, but when they became wider I was compelled to turn back to the moraine because my companions, due to their inexperience, could not serve me as reliable assistants when crossing the glacier. The colour of the ice in the deep crevasses was not blue, as in European glaciers, but the same green colour of the best Trans-Baikal beryls.

<sup>1</sup> Kosharov no. 147.

<sup>2</sup> Kosharov no. 148.

<sup>3</sup> Kosharov nos. 121, 127 and 133 (2).

The height which I had reached, going up the glacier, turned out to be 3,285 metres according to a hypsometric measurement.

Having clambered again from the glacier onto its left moraine, I came down into the valley, which I reached at two o'clock in the afternoon, with the air temperature at 12.5°C. Here I devoted myself to the most highly interesting collection of Tian'-Shan' alpine plants from the pastures of the Marco Polo sheep (*Ovis poli*) and by evening reached the bivouac of my caravan, where the air temperature turned out to be 7°C at seven o'clock.

Fires were lit, tea and supper were quickly prepared, and by the light of my lamp I wrote up my diary and packed up in sheets of blotting-paper my treasures, the plants of Tengri-tag which no-one had ever seen before. Wherever there were no Kirgiz *auly* and it was impossible to get Kirgiz sheep, our supper consisted of soaked rusks of black bread, fried in the fat of a sheep's tail.

Among the plants which I collected in the upper Sary-dzhas valley on 29 June, there were four new species. One of them was *Robinia*, which was not described hitherto, and which was like *Caragana jubata*, but was notable for the greater thickness of its light grey verdure, greater length of its needles and for its light pink, rather than yellow, flowers. I collected and very thoroughly dried this very interesting type of plant, which the Karakirgiz called *tiuie-uiriuḡ* (camel's tail), but Dr Regel, the Director of the Botanical Gardens, who described the plants collected by me, overlooked this one, confusing it with a species of *Caragana jubata* which was very different from it, was widespread throughout the Altai-Saian upland, and which had yellow flowers, and belonged to another species of the *Caragana* genus. The remaining three new species which I found in the Sary-dzhas valley on 29 June belonged to the family of Compositae; when they were later described, they received the following names: *Saussurea semenovi*, *S. glacialis* and *Cirsium semenovi*.

Of the plants which were already familiar to me, the most striking of all were light blue carpets of the common forget-me-not (*Myosotis silvestris*), widespread in the meadows of our native Sarmatian Plain, golden-yellow carpets of that type of onion which gave the name of 'Tsun-lin' (Onion Mountains) to the central part of the Tian'-Shan', where I discovered these plants (*Allium semenovi*) for the first time, and finally dark blue carpets of the high-alpine species of *Gentiana*.<sup>1</sup>

On 30 June my detachment moved off at full strength from our camp at six

<sup>1</sup> [Semenov:] Here is a complete list of 60 plants collected by me in the Sary-dzhas valley on 29 June: *Thalictrum alpinum*, *Anemone micrantha*, *Ranunculus cymbalariae*, *R. altaicus*, *R. gelidus*, *Oxygraphis glacialis*, *Callianthemum rutaefolium*, *Hegemone lilacina*, *Isopyrum grandiflorum*, *Aconitum rotundifolium*, *Corydalis gortschakovii*, *Parrya stenocarpa*, *Draba pilosa*, *D. lactea*, *D. stellata*, *D. incana*, *Thlaspi cochleariforme*, *Erysimum cheiranthus*, *Taphrospermum altaicum*, *Hutchinsia pectinata*, *Viola grandiflora*, *Lychnis apetala*, *Alsine villarsii*, *Cerastium trigynum*, *Caragana jubata*, *Oxytropis kashmiriana*, *Ox. oligantha*, *Astragalus brachytropus*, *Hedysarum polymorphum*, *Spiraea oblongifolia*, *Potentilla sericea*, *Saxifraga flagellaris*, *Chrysosplenium nudicaule*, *Galium songaricum*, *Aster alpinus*, *A. flaccidus*, *Calimeris altaica*, *Erigeron uniflorus*, *Richteria pyrethroides*, *Tanacetum ledebourii*, *T. pulchrum*,

o'clock in the morning with the temperature at 3.5°C, and we went down the valley of the Sary-dzhas, along the right side of the river until its course came into a longitudinal valley and turned westwards along it. From this point, at ten o'clock in the morning, we began to climb the high pass which separated the longitudinal valleys of the Sary-dzhas and Kok-dzhar, which were parallel to each other, and having reached the crest of the pass at about one o'clock in the afternoon, we descended into the valley of the Kok-dzhar, and then, having come out onto our old track, got to the Tuz-kok-dzhar by evening, and here, having climbed about five *versts* above a saline spring, we halted for the night.

Near this camp, to my special delight, I found outcrops of mountain limestones with their characteristic fossils of the Carboniferous system (*Productus giganteus*, *Pr. semireticulatus*, *Spirifer sp.* *Bellerophon*, *Pleurotomaria*, and others). This find was all the more interesting as it determined the profound geological antiquity of the upheaval of the 'Tian'-Shan', which undoubtedly constituted the frame of the great Asian continent from as early as the end of the Carboniferous period.

On 1 July we left our camp at the Tuz-kok-dzhar at eight o'clock in the morning, and in about two hours we reached the upper reaches of this river, from where we began to climb along the steep slope, which however was still accessible to our camels, to the crest of the mountain pass, on which there were visible patches of snow which had not yet thawed. During our ascent, wherever we came across outcrops of bedrock, they consisted of red sandstone, which had an almost vertical inclination (85° to the north). The height of the pass, according to my hypsometric measurement at two o'clock in the afternoon, was 3,320 metres. The vegetation on the entire mountain pass was high-alpine.<sup>1</sup> The views of Khan-tengri and part of Tengri-tag from the pass, though more restricted than from Kok-dzhar Pass, were nevertheless fascinating. From the other side, the view northwards over the Kokpak valley, which was deeply incised, was extensive and majestic.

It was along one of the sources of this river that we began to descend from the pass directly to the north, but after half an hour of travel we turned to the north-

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*Gnaphalium leontopodium*, *Saussurea pygmaea*, *S. semenovi*, *S. glacialis*, *S. sorocephala*, *Cirsium nidulans*, *C. semenovi*, *Alfredia acantholepis*, *Taraxacum caucasicum*, *T. steveni*, *Crepis multicaulis*, *Primula cortusoides*, *P. nivalis*, *Gentiana falcata*, *G. aurea*, *G. prostrata*, *G. kurroo royle*, *G. frigida*, *Swertia marginata*, *Myosotis sylvatica*, *Salix sibirica*, *Allium semenovi*, *Festuca altaica*, *Poa alpina*, *Koeleria cristata*, *Deschampsia coelerioides*, *Ptilagrostis mongholica*, *Phleum alpinum*.

[For a wider discussion of the Sary-dzhas valley, see Bondareva, *Pochvy, passim*.]

<sup>1</sup> [Semenov:] Here is a list of plants collected by me at the Tekes Pass on 1 July: *Anemone narcissiflora*, *Ranunculus cymbalariae*, *Ran. altaicus*, *Ran. gelidus*, *Callianthemum rutaefolium*, *Isopyrum anemonoides*, *Isopyrum grandiflorum*, *Viola grandiflora*, *Draba rupestris*, *Lychnis apetala*, *Alsine villarsii*, *Geranium saxatile*, *Caragana jubata*, *Potentilla multifida*, *Gnaphalium leontopodium*, *Serratula nitida*, *Scorzonera austriaca*, *Taraxacum steveni*, *Joungia flexuosa*, *Myosotis sylvatica*, *Eritrichium villosum*, *Arnebia perennis*, *Pedicularis rhinantoides*, *Ped. versicolor*, *Dracocephalum altaicense*, *Dr. nutans*, *Orithya heterophylla*, *Allium semenovi*, *All. atrosanguineum*, *All. alataviense*, *Carex atrata*. Besides 31 listed plants, that day I found another new Compositae plant, which later received the name of *Serratula procumbens*.

east and soon came out along an arid valley to the source of the river Tekes. At first we travelled along the arid part of the valley, but further along it the sources of the Tekes began to gather. Red sandstones were replaced by limestones here, and then by breccia. At the confluence of its sources the Tekes became a significant river, heading at first to the north and afterwards to the north-east.

As we were coming down along the Tekes, we entered the forest zone. High alpine plants began to disappear, and alpine shrubs began to show: *tiuie-ķuiriuķ* (*Caragana jubata*), *arga* (*Juniperus sabina*), *cherganak* (*Berberis heteropoda*), honeysuckle (*Lonicera hispida*, *L. microphylla*, *L. ķarelini*, *L. caerulea*), sea buckthorn (*Hippophae rhamnoides*), willows (*Salix nigricans*, *S. sibirica*), and at last taller trees: rowan (*Sorbus aucuparia*), birch (*Betula alba*), poplar (*Populus suaveolens*) and spruce (*Picea schrenķiana*).

As we were coming down the Tekes valley, the grasses which I came upon belonged more and more to the cultivated zone and resembled the most commonplace European-Russian flora.<sup>1</sup>

As for the bedrock which I encountered while coming down the Tekes valley, in the alpine zone the sedimentary rocks became replaced by crystalline ones, namely granites and syenites, which extended along our path for about an hour and a half. Then the sedimentary rocks began again, first schists, then sandstones, and eventually mountain limestones with their characteristic fossils of the Carboniferous system – *Productus semireticulatus*, and so on. These limestones had a dip of 50° to the west. They were followed by fine schistose, non-crystalline (argillaceous) shales, similar to those which are known in geological nomenclature under the name of *Brandschiefer*, in which strata of coal are often found. This development of the Carboniferous system strata in the upper reaches of the Tekes is explained by the abundance of rich deposits of coal lower down the river

<sup>1</sup> [Semenov:] Here is a list of plants which I found in the forest and cultivated zone of the Tekes on 1 and 2 July: *Thalictrum minus*, *Th. simplex*, *Ranunculus acris*, *Ran. polyanthemus*, *Trollius altaicus*, *Aquilegia vulgaris*, *Delphinium caucasicum*, *Aconitum lycoctonum*, *Berberis heteropoda*, *Papaver alpinum*, *Turritis glabra*, *Draba nemorosa*, *Capsella bursa-pastoris*, *Parnassia laxmani*, *Polygala vulgaris*, *Dianthus crinitus*, *Gypsophila acutifolia*, *Silene inflata*, *Alsine villarsii*, *Cerastium vulgatum*, *Cer. alpinum*, *Geranium pratense*, *Thermopsis lanceolata*, *Medicago platycarpa*, *M. foliata*, *Trifolium repens*, *Tr. pratense*, *Oxytropis ochroleuca*, *Coronilla varia*, *Vicia cracca*, *V. sepium*, *Lathyrus pratensis*, *Geum strictum*, *Sanguisorba alpina*, *Potentilla sericea*, *P. recta*, *Alchemilla vulgaris*, *Pyrus aucuparia*, *Carum carvi*, *Archangelica decurrens*, *Anthriscus sylvestris*, *Lonicera hispida*, *L. caerulea*, *L. microphylla*, *L. ķarelini*, *Galium verum*, *Valeriana officinalis*, *Achillea millefolium*, *Tanacetum vulgare*, *Artemisia dracunculus*, *Gnaphalium leontopodium*, *Senecio sibiricus*, *Jurinea chaetocarpa*, *Taraxacum officinale*, *Crepis sibirica*, *Campanula glomerata*, *C. patula*, *Adenophora polymorpha*, *Gentiana falcata*, *Polemonium caeruleum*, *Myosotis sylvatica*, *Veronica spicata*, *Euphrasia officinalis*, *Pedicularis comosa*, *P. rhinantoides*, *Lycopus exaltatus*, *Origanum vulgare*, *Thymus serpyllum*, *Nepeta nuda*, *Nepeta ucranica*, *Dracocephalum altaense*, *Scutellaria orientalis*, *Lamium album*, *Phlomis tuberosa*, *Goniolimon speciosum*, *Plantago major*, *Eurotia ceratoides*, *Rumex acetosa*, *Rumex aquaticus*, *Polygonum bistorta*, *Hippophae rhamnoides*, *Euphorbia esula*, *Salix nigricans*, *S. sibirica*, *Urtica cannabina*, *Betula alba*, *Picea schrenķiana*, *Juniperus sabina*, *Alisma ranunculoides*, *Orchis latifolia*, *Iris guldenstadtiana*, *Orithyia heterophylla*, *Gagea liottardi*, *Allium atrosanguineum*, *Al. alataviense*, *Al. obliquum*, *Veratrum album*, *Phleum boehmeri*, *Lasiagrostis splendens*.

## THE HEART OF THE TIAN'-SHAN'

(in Chinese Kul'dzha province). Having crossed to the left side of the Tekes, we chose here a place for our overnight stay for the night of 2 July at the confluence of a small spring with the Tekes, among bushes of *archa* (*Juniperus sabina*).

On 2 July we left our camp at the Tekes at seven o'clock in the morning; at first we descended along the river over a widening valley, which below the zone of coniferous forests became covered with luxuriant herbaceous vegetation of European type. Having journeyed along the broad valley for about two hours, we turned to the north-west, began to climb the mountain and by eleven o'clock in the morning reached the summit of a not particularly high pass, which separated the Tekes valley from that of the river Karkara. From the pass we came out onto the familiar track of Dzhil'karagai, which brought us into the Karkara valley, and from there we reached the nomadic camps of Burambai without difficulty before evening.

In his *auly* some interesting, and to me even important, news was awaiting us. A very typical reply to my letter had been received from my '*tamyr*', the supreme *manap* of the Sarybagish, Umbet-Ala. He replied that he did not consent to any private redemption deal with his enemy Burambai pending mutual reconciliation of both tribes, in which the score must be finally settled as to who would be indebted to whom. According to Kirgiz customary law, the basis of such scores is, first of all, the calculation of the losses of each side in sheep, cattle, horses, camels and, finally, in people, both 'commoners' and of 'blue blood'. All these losses were converted into a number of sheep, which served as monetary units when doing calculations at that time. In doing such calculations, the ascription of this or that value to an ox, cow, horse, camel or even a 'common person' in relation to a sheep, did not present any difficulty, as it was determined by custom; and only the loss of a person of 'blue blood', or someone acknowledged by public opinion as a '*batyr*', was subject on each occasion to special evaluation by mutual consent. Thus, for instance, the death of the Sarybagish *manap* Urman should have as a consequence for the Bogintsy the recovery of a few thousand monetary units, that is sheep. As for prisoners, since they had already become possessions of the tribe which had captured them, they were exchanged with great ease one for one, and if by chance there was no one to be exchanged in return, the redemption of 'common people' was accomplished according to a fixed indisputable statutory price, and the redemption of people 'of blue blood' and the '*batyrs*' took place by mutual consent. It was this kind of private agreement with his enemy Burambai concerning the female prisoners belonging to his family that Umbet-Ala repudiated, but he informed me that he was sending the four female prisoners in question, including his own sister, as a gift to me, as his *tamyr*, leaving it to me to be the arbiter of their future destiny instead of himself.

It goes without saying that I hastened to receive the captives, who had been brought in, explaining to them that, since they had been released from captivity,



they could immediately return home, while I offered Umbet-Ala's sister at her discretion to return either to her husband or to her brother. In response to my question, she explained to me that even Umbet-Ala himself had suggested to her to stay and live in easy circumstances and respect at his place, but she had spoken out resolutely that she wished to remain true to her duty and to return to her husband's family and tribe, into which she had been given by her parents of her own free will. The captives, and especially the daughter, of the deceased Urman, were received into old Burambai's family with honour and joy. Having passed over the honoured captives into Burambai's hands, I asked him only to help me to send gifts in return to Umbet-Ala in a manner appropriate to his gift according to custom, since I had brought the captives back into their families without ransom. For this purpose Burambai presented me with twelve of the best horses, and I added to that six pieces of Caucasian silk cloth, some luxurious Kazan' wares embroidered with gold and a few Zlatoust weapons.<sup>1</sup>

Even more important, although very sad but quite authentic, information concerning the fate of Adolf Schlagintweit,<sup>2</sup> my Berlin colleague, was brought to me by Burambai's envoys, who had been sent by him into Kashgar for reconnaissance at my request. The envoys sent by Burambai two days before my last journey into the Tian'-Shan' to the glaciers of Sary-dzhas, came out to this river a little earlier than I and from there via the roundabout route to Kuiliu, having crossed the Tian'-Shan' by way of Ishigart, reached Kashgar on their excellent horses in eight days of travelling, stayed there for a few days and came back to Burambai the day after my return.

The envoys, who had been to Kashgar before, found there a great change. The Chinese authorities had long since been driven out by the Muslims, and in Kashgar there ruled a native *tiure* by the name of Vali-khan, who was noted for great brutality. In the winter of 1855–1856 a distinguished and very learned

<sup>1</sup> Ironworks were established in Zlatoust, Ufa province, in 1754 and attracted craftsmen in the manufacture of steel weapons, especially rifles, from Solingen in Germany. In the later nineteenth century its foundries and factories specialized in munitions of all sorts.

<sup>2</sup> Adolf Schlagintweit (1829–57) was one of five sons of a Munich doctor, three of whom achieved fame for their exploration of India and the Himalayas. In 1854 with his brothers Herman and Robert, on the initiative of von Humboldt and under the sponsorship of the Prussian Court and the British East India Company, he was sent to India to make magnetic, geological, hypsometric and meteorological observations. Having crossed the peninsula from Bombay to Madras, in May 1855 Adolf and Herman journeyed to the North-western provinces to study the central Himalayas, reaching an altitude of 6,788 metres and entering Tibet. The following year, Herman and Robert became the first Europeans to visit Kuen-Lun and Chinese Turkestan, having crossed the Karakoram from Ladakh, and in November 1856 were re-united with Adolf who had been exploring the upper reaches of the Indus. In the spring of 1857, when his brothers had returned to Europe, Adolf crossed the Afghan frontier but was detained near Iarkand and was taken to Kashgar, where he was executed on 26 August. In 1888 the Imperial Russian Geographical Society erected a memorial to him on the site of his death. Semenov had met the brothers when they were fellow students in Berlin in 1854. Semenov, *Detstvo i iunost'*, p. 257; Uhlig, 'Die Giessener Geographen', pp. 87–103.

'fryang'<sup>1</sup> arrived in Kashgar and brought with him rich supplies of various things: beautiful fabrics, weapons, clocks, telescopes, some instruments and books. At first Vali-khan received him well and at his wish was even looking for guides for him among the Karakirgiz, as the 'fryang' was going to travel to Mus-tag in the spring of 1857, but then for some reason Vali-khan fell out with the 'fryang' and put him in prison, took away all his things and before the spring of 1857 ordered his head to be cut off in the square at Kashgar.

This information was passed on to me with such details that it was impossible to have any doubt as to the death of the courageous traveller. And every way that occurred to me in order to save Schlagintweit at the time when I arrived in Burambai's *auly*, where vague rumours were already rife that Vali-khan had imprisoned some distinguished 'fryang', by now was too late. As for gathering more accurate information about the death of Schlagintweit, I decided, on my return to Omsk, to ask the Governor-general urgently to equip for this purpose the Cossack Lieutenant Valikhanov, the only Kirgiz with a European education, and send him to Kashgar. That was subsequently accomplished with total success, and considerably later at the place of Schlagintweit's execution the Russian Geographical Society erected a modest memorial to the courageous scientist.

During my three-day stay (3–5 July) in Burambai's *auly*, without wasting time, I planned a new journey into the heart of the Tian'-Shan'. Having become fully acquainted with two routes, leading across the Tian'-Shan' into Kashgaria (Malaia Bukharia), namely: the first across the Zauka and the upper reaches of the Naryn, and the second to the Sary-dzhas and Kuiliu, I sought to explore somewhat also a third, which lay entirely within the Chinese borders, namely the famous Musart Pass, which served as the main means of communication for the Chinese between Kul'dzha and the Semigrad'e, towns which were situated along the southern foot of the Tian'-Shan' in Chinese Turkestan.

I devised for myself the following plan: to come out to the upper reaches of the river Tekes along the route already familiar to me, to go down along it and to pick one of its right tributaries, which were parallel to each other, and in particular one originating in the famous Musart glaciers, and to go along it up to these glaciers so as to view from one of the adjacent summits, if only from afar, the famous Musart Pass. On Burambai's recommendation, in my undertaking I could count on the assistance of that Bogintsy clan which, while permanently leading a nomadic life on the Tekes, was on close terms with the Chinese authorities of Kul'dzha province, and at that time (1857) still paid tribute to the Chinese government.

On 6 July I now moved from Burambai's *auly* into those of that very Bogintsy

<sup>1</sup>The term *fryang*, of Turkic derivation, refers to 'Franks', i. e. foreigners, or more specifically, Europeans. For example, Freya Stark uses the word 'Ferangi' of herself in *The Valleys of the Assassins*, while Lady Macartney, wife of the British consul at Kashgar, found herself described as a 'Feranghi' there in the 1890s (*An English Lady in Chinese Turkestan*). The modern Turkish word for Europeans is *frenge*.

*manap* Toksoba, who was pointed out to me by Burambai as the one who maintained his links with China. Toksoba received me very hospitably and promised every assistance in order to achieve my aim: to proceed to the Musart glaciers from their western side, totally by-passing the Chinese pickets. Among the tributaries of the Tekes, along which it was possible to achieve such an ascent, he especially named the Karakol (which should not be confused with the other Karakol of the Issyk-kul' system) and the Orto-Musart. In order to accomplish my undertaking I made it easier for myself by taking with me only thirty Cossacks, leaving the remainder with all the camels and baggage in the *auly* of Burambai, who was completely protected by their presence from the attacks of the Sarybagish.

On 7 July, together with Toksoba, I left for a new nomad camp on the river Sary-dzhas, a tributary of the river Kegen (not to be confused with the Sary-dzhas of the Tarim and Lob-nor system, which I mentioned earlier), and spent the night by this river with Toksoba.

On 8 July, having gone up along the Malaia Sary-dzhas, I came out to a pass, which was not particularly high, and from it descended to the river Tekes, which I followed all that day up to its confluence with the river Karakol. Here at six o'clock in the evening I stopped for the night. The air temperature was 8°C. A hypsometric measurement gave 1,960 metres for the altitude of the Tekes valley at that point.

On 9 July at five o'clock in the morning we moved off from our camp at the Tekes and in about two hours we were into the Karakol valley. Along this valley we climbed for three hours, reached the limit of the forest and came out into an alpine valley, where the most remote of the Bogintsy nomadic encampments of the clan of *manap* Toksoba were situated. Here, before midday we made a halt in a convenient place where I wanted to leave my detachment in order, without any baggage, but with Kosharov, three Cossacks and two Bogintsy from Toksoba's clan, immediately to climb the mountain, to cross the crest rising above the valley of the Karakol, to descend to the river Orto-Musart, and to find a convenient place for our overnight camp on the upper part of its course. And I planned to use the next three days for climbing such peaks as were adjacent to the source of this river, and from which I could view the Musart Pass, without going near the Chinese pickets and Chinese caravan route. My undertaking was made easier by the fact that in 1857 the links of the Chinese through this pass with Semigrad'e, which had seceded from them and was hostile towards them, were very weak.

But we had barely had time to separate from our detachment and to start our trip to Orto-Musart without baggage, when suddenly a messenger from Sultan Tezek, 'all covered in lather and dust', galloped up to us with news which immediately changed all my plans. It turned out that Tezek, who had been treacherously captured by Tarybek, one of the junior sultans of the Great Horde, was

lying fettered as his prisoner, and was hourly at risk of being killed or being delivered up to his enemies, the Sarybagish.

This is how it all happened. Among the clans of the Atban tribe, who were subject to the senior Sultan Tezek, there was a clan of the junior Sultan Tarybek, whose nomadic encampments went far beyond all those of the Great Horde, to the south of the river Ili. Tarybek liked to spend the hot season in the cool alpine zone of the southern chain of the Zailiiskii Alatau, and in recent years did not even return to the winter camps in the Ili plain, remaining over winter in the deep and well protected valleys and gorges of the Zailiiskii Alatau. In this way Tarybek's link with the rest of the Atban tribes gradually became weakened, and he even stopped paying his customary tribute to his chief sultan.

Tezek, who had arrived after me in the Bogintsy domains with a strong detachment, wanted to use this opportunity in order to restore his dominion over the lands of his whole tribe which he passed in transit. Not suspecting any danger, he arrived with his escort of four horsemen into Tarybek's *aul* for talks on the afore-mentioned subject and was met by the latter with honour. But the next day, when Tarybek did not like Tezek's demands, he was treacherously seized and put in chains. During the following night two of Tezek's horsemen managed to escape. On his instructions one of them made his way to me, and the other one to his trusted friend, Atamkul, the famous Atban *batyr*, who was in the Bogintsy *auly* with a part of Tezek's detachment. However, Tezek's other two horsemen remained with him in captivity.

Having received the sudden news of Tezek's fate, I immediately decided to hurry, come what may, to the rescue of my ally, and raised all my detachment to retrace our steps. Not having camels with us, we were able to travel at great speed and at the dead of night reached Toksoba's nomad camps. Here we rested several hours awaiting a change of horses.

The following day, 10 July, we left on those fresh horses at dawn, covering the whole way with unusual speed, and returning immediately after midday to Burambai, who had already given orders to gather horses and men for our expedition to rescue Tezek. By eight o'clock in the evening everything was assembled. Our detachment consisted of forty Cossacks of my escort (I left ten Cossacks with my baggage and Kosharov in Burambai's *auly*), 200 Atbans under the command of Atamkul, who was courageous and faithful to Tezek, and finally 800 Bogintsy horsemen under the command of Burambai's son, Emirzak, whose wife I had brought back from the enemy's captivity. We were equipped in such a way that the Cossacks and Atbans each had two saddled horses, on one of which he galloped with the other running behind led by the rein, and he changed from one horse to the other after every thirty *versts*.

Before my departure I bade farewell to the worthy old man, Burambai. I thanked him for that assistance, without which I would have been unable to penetrate the valleys of Tian'-Shan' and the mountain heights of Tengri-tag, and

repeated to him my promise to do my utmost for him to be accepted as a Russian subject. Our parting was all the more touching as each of us realized what we owed to the other.

We set out before nine o'clock in the evening and, with the aid of the spare horses, by dawn on 11 July reached Tarybek's encampments, which were in the depths of one of the valleys in the southern chain of the Zailiiskii Alatau, on its northern side. Thus we had galloped approximately 130 *versts* in seven hours, having made only one half-hour stop half-way.

Within five *versts* of Tarybek's *aul* I halted our whole detachment in a deep ravine so as to count our forces. It turned out that the forty Cossacks of my escort were all present, that of Atamkul's 200 Atbans only 20% had fallen behind, but that of the Bogintsy detachment of 800 horsemen only 20% had arrived, as the majority of them did not have spare horses. For all that, it was impossible to await the arrival of the laggards, as rumour of our arrival might reach Tarybek, and he would be able to put an end to the captive Tezek's life. Therefore, I immediately selected the best hundred horsemen and galloped towards the *aul*, but ordered the others to spread out in such a way as to cut off all the *aul*'s exit from the valley in which the nomads were found. However, I gave strict orders not to undertake any hostile actions against the *aul*, trying to take only Tarybek.

We found the entire extensive *aul* in its full and picturesque process of migrating. Sauriuk, Tarybek's brother rode out towards me and explained that Tezek was no longer in the *aul*. He had escaped with one of his horse-men at night, and the other one who remained in captivity was immediately introduced to me and confirmed the news about Tezek, maintaining that his sultan was already in absolute safety in the *aul* faithful to him. Tarybek was not in the *aul* either; he had galloped away into the mountains at dawn, as soon as he received the first news of our approach. I explained to Sauriuk that we had no intention of undertaking any hostilities against the *aul* and did not even wish to lay obstacles to their moving off, but would certainly have captured the entire *aul* with its herds if Tezek was not alive or if he had been delivered up to the Sarybagish. Thus our whole expedition was concluded happily. I bade farewell to Emirzak, who returned to his father with his horsemen, gathering all those who had fallen behind on the way, and to Atamkul, who with his horsemen made for his *aul*, which was not very far from our stopping place. Moreover, Atamkul made me promise to visit him. I also received similar invitations from Tarybek's brothers, Sauriuk and Basurman.

As a consequence of these necessary visits and of waiting for my Cossacks, the baggage and the artist Kosharov, who had stayed with Burambai, I spent almost six days in the Atban nomad camps of the Zailiiskii Alatau, becoming acquainted with the way of life of the only Kirgiz-Kazakh tribes whose representatives could be considered true mountain people.

During those days I visited Atamkul, Tarybek's brothers, Basurman and

Sauriuk, and his nephew, and at last my camels, packs, and the artist Kosharov with ten Cossacks arrived. There also arrived to see me envoys from Tezek and from the *pristav* of the Great Horde, to whom I had sent a letter with information about my return within the borders of the domain of the Great Horde. There also came back to me the Atban Bek and Cossack Ianovskii, whom I had sent looking for Tarybek, informing him that he should go to Tezek to acknowledge his guilt, and that was confirmed by the envoy of Tezek himself.

While I was staying in Sauriuk's *aul*, there arrived one of his relatives, who had only just dragged himself along on foot to his *aul*, having saved his life, one may say, miraculously. He was passing by with three Atbans from the same *aul* in the vicinity of Suok-togoi, where after the confluence of the three Merke with the Kegen, the combined river forces its way between sheer cliffs through an awesome porphyry gorge as a noisy water-fall. Here the Atbans encountered a Sarybagish *baranta*, which captured three of them, while the story-teller managed to jump with his horse into the rapid river Kegen, which, however, he was unable to cross. The furious torrent drew him into a waterfall, which carried him through the gorge. His horse was smashed against the rocks, but the badly injured horseman was thrown onto the bank and crawled into a safe place, from where he managed to reach his *aul* after three days.

On 17 July after midday, having become interested in the story of how Sauriuk's kinsman was carried by the waves of the rapid river over the Suok-togoi waterfall, I set out without baggage to that place where the river Kegen, after its confluence with the three Merke, enters a picturesque gorge, through which it forces its way between sheer cliffs as an exceptionally noisy waterfall. Having reached this place by evening, I stopped for the night.

On 18 July a hypsometric measurement gave 1,220 metres of absolute altitude for the level of the river above the waterfall. The air temperature here was 17°C at seven o'clock in the morning. At that hour I set out from my camp, called at Sauriuk's *aul* and took with me my whole detachment in order, on reaching the river Chilik, to undertake an investigation of its beautiful and wide longitudinal valley, which separates the two parallel chains of the Zailiiskii Alatau. Having reached the Chilik by evening, we looked for a suitable place for an overnight camp, to continue our journey upwards along its valley the next day.

On 19 July we left our camp at about eight o'clock in the morning and after about three *versts* came upon the first outcrops of porphyry. Then our path diverged from the river bed and proceeded through porphyry hills, now moving away from the Chilik's river bed, now coming near it. The soil was stoney, rather barren and its vegetation reminded me of the flora of some coastal areas of Issyk-kul', having a steppe character. Of grasses growing here there were: *chii* (*Lasiagrostis splendens*), feather-grass (*Stipa capilata*), *Andropogon ischaemum*, *Setaria viridis*, and of other species some characteristic plants of the south-Russian

steppes: a herbaceous type of non-climbing clematis, with large dark purple flowers (*Clematis integrifolia*), catmint (*Nepeta ucrainica*), and of saline plants – *Brachylepis salsa*. In rocky places there grew many shrubs: *tavolga* (*Spiraea hypericifolia*), Siberian acacia (*Robinia pygmaea*), wild cherry (*Prunus prostrata*), and *Ephedra vulgaris*. These shrubs were often intertwined with Dzhungarian clematis (*Clematis songarica*).

After three hours' journey we came out to the first right-hand tributary of the Chilik encountered by us, the Karabulak. Between the Karabulak and the next tributary, the Kaindy, the valley of the Chilik gradually turned straight to the west, acquiring fully the character of the main longitudinal valley of the Zailiiskii Alatau. There appeared outcrops of sedimentary rocks, at first shales, and then limestones.

I spent about two hours reconnoitring without baggage the transverse valley of the Kaindy, while my main detachment continued its journey along the valley of the Chilik. The river Kaindy excited my curiosity by the fact that it had derived its name from the birch-trees growing in its valley. And, indeed, I found luxuriant woodland vegetation in this valley. Besides birch (*Betula alba*), there were growing poplars, two beautiful species of willow (*Salix purpurea* and *S. sibirica*), rowans with very large berries (*Pyrus aucuparia*), but rather different from our European ones, *boiarka* (*Crataegus pinnatifida*), *argai* (*Cotoneaster nummularia*) and, finally, shapely spruces (*Picea schrenkiana*).

It is remarkable that all the right-bank tributaries of the Chilik, beginning with the Kaindy, flow along transverse valleys, parallel to each other, and originate in the perpetual snows of the southern chain of the Zailiiskii Alatau. At the tops of almost all of these rivers there is a pass, leading to the southern side of this chain, (which from the Issyk-kul' side is called Kungei Alatau), towards the lake whither other rivers flow from the same passes. But both such rivers, flowing in opposite directions from one and the same crest, that is a tributary of the Chilik and a tributary of the Issyk-kul', have one and the same name: for instance, Kaindy, Shaty, Kurmenty.

After returning to my detachment, since I continued to go upwards along the valley of the Chilik, far from the river, we had to go over the easy passes separating the transverse valleys, from which flow the right-bank tributaries of the Chilik. Thus, from the Kaindy we came out to the river Shaty, in the upper reaches of which there was an interesting high pass, which we had already climbed from its southern side, along the river Shaty, a tributary of the Issyk-kul'. That is why I did not reconnoitre the valley of the river Shaty, a tributary of the Chilik, but went over an easy pass to the river Kul', into the valley of which I had also travelled light, coming upon outcrops of porphyry before reaching the Kul' itself. From the river Kul', I crossed over an easy pass to the river Kurmenty, which I chose for my overnight camp. All of this, together with excursions into the transverse valleys, took us the whole day. Into these valleys I was attracted by

the luxuriant vegetation growing on excellent soil, which contrasted sharply with the barren rocky soil of the banks of the Chilik.

On the bank of the river Kurmenty we picked a place for our overnight halt, a little above the place where it emerged from the transverse valley, in a grove which consisted of poplars, rowans, willows, and black barberries (*Berberis heteropoda*), intertwined with a different species of clematis (*Clematis orientalis*). Near our camp there was growing a lot of blue onion (*Allium caeruleum*). Having decided to devote all of the next day to an ascent of the interesting Kurmenty Pass from its northern side, I fell fast asleep in my tent to the now familiar sounds of a rapid and foaming mountain river.

On 20 July from five o'clock in the morning without any baggage but with Kosharov, three Cossacks and two Kirgiz, I began my ascent of the Kurmenty Pass, which turned out to be one of the most interesting high passes leading from the longitudinal valley of the Chilik to Issyk-kul'. Within half an hour from our camp we came upon outcrops of siliceous shales, and in an hour limestones with fossils, which were found to belong indisputably to the Devonian system. The vegetation of the lower part of the Kurmenty valley resembled that of the agricultural colonized zone of the Zailiiski territory, but as coniferous trees began to appear in it, gradually it was changing into the vegetation of the forest zone.

At first our path went along the left bank of the Kurmenty, but during the third hour of our journey it deviated from the river, passing around the sheer precipices of its left bank, and began to climb steeply up the mountain, moving already through the zone of coniferous forest, where herbaceous vegetation began to assume a sub-alpine character. It was here that I was able to find three absolutely new species of plants. One, of the Dymiankovii family (Fumariaceae), later received the name *Corydalis semenovi*; another, of the Umbelliferae, was named *Peucedanum transiliense*; the third, from the same family, even turned out to be a new species, named by Regel in my honour *Semenovia transiliensis*.<sup>1</sup>

<sup>1</sup> [Semenov:] Here is a complete list of 80 plants collected by me that day (20 July) in the forest zone: *Clematis songarica*, *C. orientalis*, *Atragene alpina*, *Thalictrum minus*, *Th. simplex*, *Ranunculus polyanthemus*, *Delphinium caucasicum*, *Aconitum lycocotum*, *Berberis heteropoda*, *Chelidonium majus*, *Corydalis semenovi* n. sp., *Helianthemum soongoricum*, *Polygala vulgaris*, *Dianthus crinitus*, *Vaccaria vulgaris*, *Silene lithophila*, *Stellaria glauca*, *Cerastium vulgatum*, *Linum perenne*, *Hypericum perforatum*, *Geranium albiflorum*, *Medicago falcata*, *Astragalus vicioides*, *Lathyrus pratensis*, *Spiraea media*, *Alchemilla vulgaris*, *Rosa pimpinellifolia*, *Pyrus aucuparia*, *Cotoneaster nummularia*, *Bupleurum ranunculoides*, *Libanotis condensata*, *Peucedanum transiliense* n. sp., *Chaerophyllum sphallerocarpus*, *Aulacospermum anomalum*, *Semenovia transiliensis* n. sp., *Patrinia rupestris*, *Scabiosa ochroleuca*, *Tanacetum fruticosum*, *T. transiliense*, *Achillea millefolium*, *Artemisia dracunculus*, *Ar. absinthium*, *Gnaphalium silvaticum*, *Doronicum oblongifolium*, *Saussurea salicifolia*, *Glossocoma clematidea*, *Campanula glomerata*, *Adenophora polymorpha*, *Myosotis sylvatica*, *Euphrasia officinalis*, *Rhinantus crista-galli*, *Pedicularis comosa*, *Origanum vulgare*, *Nepeta ucranica*, *Dracocephalum imberbe*, *Dracocephalum altaicense*, *Phlomis alpina*, *Lamium album*, *Polygonum viviparum*, *P. bistorta*, *Euphorbia pachyrhiza*, *Salix sibirica*, *S. purpurea*, *Populus laurifolia*, *Picea schrenkiana*, *Juniperus sabina*, *Iris guldenstadiana*, *Orithya heterophylla*, *Allium schoenoprasum*, *A. caeruleum*, *A. strictum*, *Carex nitida*, *C. nutans*, *Festuca altaica*, *Brachypodium pinnatum*, *B. schrenkianum*, *Poa alpina*, *P. nemoralis*, *Avena pratensis*, *Phleum alpinum*.



Eventually, we left the limits of the forest vegetation and the tall-trunked spruces were replaced by sub-alpine shrubs, namely: *archa* (*Juniperus sabina*) and *tiuie-kıiriuk* (*Caragana jubata*), meadow-sweet (*Spiraea oblongifolia*) and the well-known *Potentilla fruticosa*. Before one reached the boundaries of the forest vegetation, sedimentary rocks were replaced by crystalline ones, namely diorites. The way became rocky, the slope became very steep, and the vegetation acquired a high-alpine character above the forest limit. Among the high-alpine plants there was found an absolutely new species of *Astragalus*, which was later named *Oxytropis heteropoda*, and another which I found here that day turned out to be Himalayan (*Oxytropis kashmiriana*).<sup>1</sup>

The path, rising steeply along the river, which was falling in cascades, brought us to a picturesque alpine lake, which occupied a hollow surrounded by cliffs. From the lake's southern side these cliffs were especially steep and looked like a high wall with projections, in the middle of which there was a slight groove, which indicated a mountain pass. The snow on the northern slope on 20 July came down almost to the lake's shore, into which there discharged a stream, fed by this snow-field. Another stream discharged into the lake from the west-south-west.<sup>2</sup> Having crossed the latter, we began to climb in a zig-zag over a rocky precipice up the steep wall of the pass. Thickening clouds above us broke as a heavy snow-storm, which covered us with snow-flakes throughout our half-hour climb. We covered the whole distance from the edge of the coniferous forest to the top of the pass in two hours. However, when we clambered to the Kurmenty crest, the wind had already dispersed and carried away the snow clouds, and an extensive view of the southern side of the Kungei Alatau, the blue surface of Issyk-kul' and the distant majestic snowy chain of the Tian'-Shan' unfolded before us in its full splendour.

The mountain crest, in which the Kurmenty Pass was cut only slightly, fell away on the southern side just as steeply as on the northern one, by approximately 300 or 400 metres. And on its other side there was an alpine lake, from which there was rushing headlong to the south the river Iuzhnaia Kurmenty, flowing in cascades in the direction of Issyk-kul'. To the left, above the shore of the alpine lake there arose a steep granite cliff. Below, at our feet, there stretched

<sup>1</sup> [Semenov:] Here is a list of 55 plants collected by me that day (20 July) in the alpine zone: *Thalictrum alpinum*, *Anemone narcissiflora*, *Ranunculus altaicus*, *Oxygraphis glacialis*, *Callianthemum rutaefolium*, *Trollius patulus*, *Hegemone lilacina*, *Isopyrum anemonoides*, *Papaver alpinum*, *Erysimum cheiranthus*, *Viola grandiflora*, *Parnassia laxmanni*, *Dianthus alpinus*, *Silene graminifolia*, *S. lithophila*, *Lychnis apetala*, *Alsine biflora*, *Cerastium trigynum*, *C. lithospermifolium*, *C. alpinum*, *Geranium saxatile*, *Caragana jubata*, *Oxytropis heteropoda* n. sp., *Ox. kashmiriana*, *Hedysarum obscurum*, *Spiraea oblongifolia*, *Potentilla pensylvanica*, *P. fragiformis*, *Sedum coccineum*, *Saxifraga flagellaris*, *S. sibirica*, *S. hirculus*, *Chrysosplenium nudicaule*, *Angelica decurrens*, *Aster alpinus*, *A. flaccidus*, *Gnaphalium leontopodium*, *Erigeron alpinus*, *Rhinactina limonifolia*, *Tanacetum pulchrum*, *Scorzonera austriaca*, *Primula nivalis*, *Cortusa semenovi*, *Gentiana aurea*, *G. kurroo*, *Pedicularis versicolor*, *Gymnandra borealis*, *Oxyria reniformis*, *Thesium alatavicum*, *Allium semenovi*, *Luzula campestris*, *Eriophorum chamissonis*, *Carex stenophylla*, *C. atrata*, *C. frigida*.

<sup>2</sup> Kosharov no. 75.

the unbounded surface of a blue lake, the familiar Kurmenty Bay, which was distinctly visible, as on a geographical relief map.

We reached the top of the pass between one and two o'clock in the afternoon. The temperature was 4°C. A hypsometric measurement gave 3,390 metres for the height of the pass. Having admired to our heart's content the marvellous view of the blue lake, and having taken a farewell glance at all the continuous snow-white chain of the Tian'-Shan', we came down along the same route to our detachment's camp by the Chilik and it was already after sunset when we reached it.

On 21 July we came down from our camp in the valley of Tabul'gaty to the Chilik and crossed this full river onto its left bank with great difficulty and danger. The crossing over the huge rocks, above which rushed a rapid and foamy river, was very hard. The sheep, which we were driving in front of us, had to be carried over on horses one by one; even our dogs, which had joined us in the bloody battle-field of Zauka, were hardly able to swim across the river: easily carried away by the swift current, they were being thrown by chance onto one bank or the other. If they got to the right bank, they ran patiently upstream along it and having reached a ford, threw themselves into the water again, But if they reached the left bank, they ran easily to our bivouac, which we had set up there after crossing the river. It was especially difficult for our camels to climb the left bank terrace along a slippery path. The arduous crossing took us half a day.

In this place the forest vegetation of the Chilik valley consisted of two types of willow (one with very narrow leaves), birch (*Betula alba*), common aspen (*Populus tremula*), rowan (*Pyrus aucuparia*) and a small number of shapely spruces (*Picea schrenkiana*), and among the shrubs: two species of honeysuckle (*Lonicera tatarica* and *L. caerulea*), *cherganak* (*Berberis heteropoda*), wild cherry (*Prunus prostrata*), currants (*Ribes heterotrichum*) and sea buckthorn (*Hippophae rhamnoides*).

Having travelled for about eight *versts* up the Chilik valley, we reached its left tributary, the Taldy-bulak, but between it and the next tributary Kuturga we began to go up along a rocky hill-side. The ascent was very difficult, the outcrops consisting at first of siliceous schist, and then of porphyry and diabase. When we reached half-way on the prospective climb, the day was drawing to an end, so much so that we decided to stop overnight by a beautiful spring between the cliffs and thickets of a local species of nettle with deeply serrated leaves and coarse fibrous stalks, like hemp (*Urtica cannabina*). It is remarkable that in this vegetation zone I also found wild hemp (*Cannabis sativa*).

On 22 July we left our camp at seven o'clock in the morning. Near it, in the outcrops of limestone, I found a great many fossils, typical of the Carboniferous system, for example, *Productus giganteus*, *Pr. semireticulatus*, as well as several types of coral. In some places this limestone was broken through by porphyry and had a dip of 40° to the south. Having come to the river Kuturga and gone

up to its source, we finally reached the top of the ridge, which here formed a kind of plateau with splendid sub-alpine meadows. After roaming over these meadows for several hours, we reached that Mai-bulak, which flowed down from the ridge southwards, discharging into the Chilik. Along this Mai-bulak we descended somewhat and found here a suitable place for our overnight halt.<sup>1</sup>

On 23 July, after moving off from our camp in the upper reaches of the Mai-bulak, we climbed the crest of the ridge and went for some ten *versts*, slowly moving along this crest through these splendid alpine meadows. The rock outcrops which we encountered consisted of limestones, then of porphyry and finally of shales. To the left of us, beyond the wide Chilik valley, there arose the peaks of the southern chain of the Zailiiskii Alatau, which had extensive expanses of perpetual snow on its northern slopes. Below, at our feet, before the course of the Chilik there were visible three parallel valleys of three transverse tributaries of the Chilik, which discharged into it above the river Kuturga. All three valleys had the name of 'apricot valley' (the First, Second and Third Uriukty).

Journeying some fifteen *versts* further along the plateau spine, by eleven o'clock in the morning at last we reached its culmination. The temperature was 7.8°C. According to my hypsometric measurement, the mountain summit was 2,890 metres in altitude. Our bivouac, where I made my observation, was at the foot of a large cliff, which consisted of argillaceous schists with a dip of 65° to the south. Here the flora were totally alpine,<sup>2</sup> and the view from this crest was extensive and delightful.

A wide longitudinal valley was etched far and deep between the two parallel chains which comprised the Zailiiskii Alatau. In it flowed the whole upper half of the river Chilik, fed by the numerous, parallel tributaries, of which the right

<sup>1</sup> [Semenov:] Here are the plants collected by me on 22 July in the sub-alpine meadows of the Mai-bulak: *Trollius altaicus*, *Papaver alpinum*, *Draba rupestris*, *Dr. nemorosa*, *Parnassia laxmanni*, *Polygala vulgaris*, *Silene lithophila*, *Lychnis apetala*, *Alsine verna*, *Cerastium alpinum*, *Cer. triviale*, *Linum perenne*, *Geranium rectum*, *Oxytropis amoena*, *Hedysarum obscurum*, *Potentilla pensylvanica*, *Sedum purpureum*, *S. hybridum*, *Carum bupleuroides*, *Asperula aparina*, *Aster alpinus*, *Calimeris altaica*, *Erigeron uniflorus*, *Cirsium semenovi* n. sp., *Gnaphalium leontopodium*, *Serratula lyratifolia*, *Mulgedium azureum*, *Adenophora polymorpha*, *Primula longiscapa*, *Androsace maxima*, *Cortusa semenovi*, *Gentiana aurea*, *Thymus serpyllum*, *Dracocephalum peregrinum*, *Leonurus glaucescens*, *Phlomis alpina*, *Triglochin maritimum*, *Allium moschatum*, *All. steveni*, *Juncus bulbosus*, *Carex vulpina*, *C. caespitosa*, *Avena flavescens*.

<sup>2</sup> [Semenov:] Here I collected the following plants: *Thalictrum alpinum*, *Ranunculus altaicus*, *Hegemone lilacina*, *Papaver alpinum*, *Corydalis gortschakovii*, *Draba pilosa*, *Dr. rupestris*, *Viola biflora*, *V. grandiflora*, *Parnassia laxmanni*, *Lychnis apetala*, *Alsine verna*, *Cerastium alpinum*, *Geranium saxatile*, *Astragalus viciodes*, *Potentilla nivea*, *Sedum hybridum*, *Saxifraga flagellaris*, *S. sibirica*, *Chrysosplenium nudicaule*, *Aster alpinus*, *Erigeron uniflorus*, *Gnaphalium leontopodium*, *Doronicum oblongifolium*, *Saussurea sorocephala*, *Primula nivalis*, *Androsace maxima*, *Cortusa semenovi*, *Gentiana amarella*, *G. aurea*, *G. kurroo*, *Eritrichium villosum*, *Pedicularis versicolor*, *Gymnandra borealis*, *Dracocephalum altaicense*, *Dr. ruyschiana*. v. *alpinum*, *Oxyria reniformis*, *Polygonum viviparum*, *Heningia robusta*.

ones flow in the transverse valleys of the southern chain, and the left ones in the transverse valleys of the northern chain. The slopes of both chains had broad expanses of permanent snow on them, but the southern chain, with less fragmentation between its snow peaks rose as a continuous wall, while the snowy peaks of the northern chain were more separated and appeared to be even higher. To our right, at our feet there flowed some springs, combining to provide the sources of the river Dzhenishke, which runs through a very narrow gorge, parallel to the Chilik valley. Beyond this gorge there rose majestically with its snowy northern peaks the chain of the Zailiiskii Alatau, which our ridge, turning to the west-north-west, was coming to join.

From the crest which we had reached, we now began to descend into the Chilik valley. At first we were walking down over alpine meadows, but after about five *versts* we began to descend quickly along a clayey path of whitish yellow colour, consequently named Ak-kiia, into the forest zone.<sup>1</sup> On entering it we had to pick our way through dense undergrowth of *archa* (*Juniperus pseudosabina*), the woody stalks of which, becoming tangled and winding almost in a spiral, spread over the rocks, becoming interwoven with honeysuckle and rowan bushes, but here and there rising upwards as mighty, though crooked, trees, intertwined with an adjacent rowan by clematis (*Atragena alpina*).

After passing through these thickets, we came into a zone of spruce forest, which descends here along the valley of the river Bai-saur to the Chilik. In this zone at three o'clock in the afternoon we made a halt for our overnight camp, just in the Chilik valley, among fir-trees on the bank of a beautiful brook, which our guides called Chin-bulak. My thermometer registered 18°C, and a hypsometric measurement gave an altitude here of 2,050 metres, which could be taken as the average height of the longitudinal valley of the Chilik.

I spent my whole evening sorting and examining the plants which I had collected on 19, 21 and 22 July in the valley across its almost entire eighty-*versts* length. There were found to be no fewer than 150 plants, collected and registered by me during those days, and the significance of this collection was that it wholly represented the July flora of the forest zone of the Trans-Ili territory at altitudes from 2,000 to 2,500 metres over the eighty-*versts* stretch of the valley which separated the two adjacent parallel chains of the gigantic ridge, which in its turn was the frontal ridge of an even more gigantic system, the Tian'-Shan'.

Here is a complete list of the 150 plants collected and noted by me in the longitudinal valley of the Chilik, between 2,000 and 2,500 metres, that is above the forest margins:

<sup>1</sup> [Semenov:] While I was coming down along the Ak-kiia path, I was able to find a new type of Compositae plant, which later received the name of *Cirsium semenovi*. Of the remaining plants encountered along this slope, the following attracted my attention: *Potentilla viscosa*, *Galium saxatile*, *Brachyactis ciliata*, *Alfredia acantholepis*, *Adenophora polymorpha*, *Polygonum cognatum*, *Melica ciliata*.

SEMENOV'S TRAVELS IN THE TIAN'-SHAN'

1. Ranunculaceae: *Clematis songarica*, *C. bunge v. integrifolia*, *C. orientalis*, *Atragena alpina*, *Thalictrum foetidum*, *Ranunculus acris*, *R. polyanthemos*, *Delphinium caucasicum*.
2. Berberideae: *Berberis heteropoda*.
3. Cruciferae: *Draba nemorosa*, *Capsella bursa-pastoris*, *Thlaspi arvense*.
4. Violarieae: *Viola canina*.
5. Polygaleae: *Polygala vulgaris*.
6. Sileneae: *Dianthus superbus*, *Gypsophila acutifolia*, *Vaccaria vulgaris*, *Silene lithophila*, *S. saxatilis*.
7. Alsineae: *Alsine globulosa*, *Stellaria glauca*, *Cerastium davuricum*.
8. Hypericineae: *Hypericum perforatum*.
9. Geraniaceae: *Geranium pratense*, *G. saxatile*.
10. Leguminosae: *Trifolium repens*, *Caragana frutescens*, *Car. pygmaea*, *Car. jubata*, *Oxytropis amoena*, *Astragalus hemiphaca*, *A. hypoglottis*, *A. vicioides*, *A. altaicus*, *A. lithophilus*, *Vicia cracca*.
11. Amygdaleae: *Prunus armeniace*, *P. prostrata*, *P. padus*.
12. Rosaceae: *Spiraea hypericifolia*, *Sanguisorba alpina*, *Alchemilla vulgaris*, *Potentilla supina*, *P. argentea*, *P. anserina*, *P. bifurca*, *P. fruticosa*, *Comarum salessowii*.
13. Pomaceae: *Cotoneaster nummularia*, *Pyrus malus*, *P. aucuparia*.
14. Onagrarieae: *Epilobium angustifolium*, *E. latifolium*, *E. palustre*, *E. roseum*.
15. Crassulaceae: *Umbilicus semenovi*, *Sedum hybridum*.
16. Grossularicae: *Ribes heterotrichum*, *R. atropurpureum*, *R. rubrum*.
17. Umbelliferae: *Carum bupleuroides*, *Bupleurum ranunculoides*, *Libanotis condensata*, *Archangelica decurrens*, *Semenovia transiliensis*, *Anthriscus sylvestris*, *Chaerophyllum sphallerocarpus*, *Aulacospermum anomalum*.
18. Caprifoliaceae: *Lonicera tatarica*, *L. xylosteum*, *L. hispida*, *L. caerulea*, *L. microphylla*.
19. Rubiaceae: *Asperula aparina*, *Galium boreale*, *G. verum*.
20. Valerianeae: *Patrinia rupestris*.
21. Dipsaceae: *Scabiosa ochroleuca*.
22. Compositae: *Galatella punctata*, *Erigeron acris*, *Achillea millefolium*, *Artemisia dracunculus*, *Art. sacrorum*, *Art. vulgaris*, *Art. rupestris*, *Senecio sibiricus*, *S. paludosus*, *Saussurea salicifolia*, *Tragopogon pratensis*, *Hieracium virosum*.
23. Campanulaceae: *Campanula glomerata*, *Adenophora polymorpha*.
24. Primulaceae: *Androsace septentrionalis*.
25. Gentianeae: *Gentiana amarella*, *G. decumbens*, *G. barbata*.
26. Borragineae: *Myosotis sylvatica*, *Cynoglossum viridiflorum*.
27. Scrophulariaceae: *Veronica spicata*, *Euphrasia officinalis*, *Scrophularia incisa*.
28. Labiateae: *Mentha arvensis*, *Origanum vulgare*, *Thymus serpyllum*,

## THE HEART OF THE TIAN'-SHAN'

*Ziziphora clinopodioides*, *Z. tenuior*, *Nepeta nuda*, *Dracocephalum altaense*, *Scutellaria orientalis*, *Leonurus glaucescens*, *Lamium album*.

29. Chenopodiaceae: *Blitum virgatum*, *Eurotia ceratoides*.

30. Polygoneae: *Rumex acetosa*, *R. aquaticus*, *Polygonum cognatum*, *P. bistorta*.

31. Eleagneae: *Hippophae rhamnoides*.

32. Euphorbiaceae: *Euphorbia polyrhiza*.

33. Salicineae: *Salix purpurea*, *S. sibirica*, *Populus laurifolia*.

34. Betulaceae: *Betula alba*.

35. Gnetaceae: *Ephreda vulgaris*.

36. Abietineae: *Picea schrenkiana*.

37. Cupressineae: *Juniperus sabina*.

38. Urticeae: *Urtica cannabina*.

39. Cannabineae: *Cannabis sativa*.

40. Orchideae: *Platanthera viridis*, *Orchis latifolia*.

41. Liliaceae: *Allium schoenoprasum*, *A. caeruleum*, *A. steveni*, *A. strictum*.

42. Cyperaceae: *Carex paniculata*, *C. punctata*.

43. Gramineae: *Elymus sibiricus*, *E. junceus*, *Triticum cristatum*, *Poa nemoralis*, *Atropis convoluta*, *Deschampsia caespitosa*, *Calamagrostis dubia*, *C. epigeios*, *Agrostis alba*, *Milium effusum*, *Lasiagrostis splendens*, *Stipa capillata*, *Phleum boehmeri*, *Setaria viridis*, *Andropogon ischaemum*.

On close examination of this list one cannot help noticing in the flora of the longitudinal Chilik valley a significant proportion of arboreal plants (more than 20%), of which only seven types are found in the middle-Russian flora. However, this is explained by the fact that the whole Chilik valley lies entirely in the forest zone of the high mountain country. But it is even more striking that, of the herbaceous vegetation of the Chilik valley, 56% belong to the common flora of the European-Russian plain, and that is a true indicator of the fact that the entire Chilik-Kebin longitudinal valley, separating the two snowy chains of the Zailiiskii Alatau, represents an area suitable by virtue of its climatic conditions for cultivation and settled colonization.

On 24 July we moved off from our camp at Chin-bulak in the Chilik valley and began to climb steeply up the mountain between Chin-bulak and Dolonbulak, encountering rocks which at first consisted of greywacke, and then of granite.<sup>1</sup> Initially we passed through a forest zone, but later, as the firs became replaced with *archa*, we entered a zone of alpine meadows. However, here we soon ran up against a continuous ridge of rocks, called *Felsenmeer* ('sea of rocks') in Alpine terminology. All our efforts to cross this ridge on horseback with our camels proved to be unsuccessful. Even my horse, which was treated with special care, was badly injured. I had to stop my whole detachment, despatching it via a

<sup>1</sup> Kosharov no. 125 (4).

diversion indicated by the Kirgiz guides, to the place which I intended for our overnight camp that day on the upper reaches of the Mai-bulak.

Still, I, for my part, not abandoning my resolve to reach the snow crest of the northern chain of the Zailiiskii Alatau rising before me, and to measure the height of the snow-line of the southern slope of this chain, continued on my way travelling light, accompanied by Kosharov, three Cossacks and one Kirgiz. We went on foot, and with difficulty dragged our horses little by little over the ridge of rocks, beyond which we re-mounted our horses and without particular trouble came to the crest across a snow-field, which was approximately one *versta* wide, and descended fairly gently from the summit. This crest, according to my hypsometric measurement, was found to be 3,740 metres in altitude, while the height of the snow-line on its southern slope was determined as 3,700 metres.<sup>1</sup> This measurement was carried out at about midday, under a completely cloudless sky and with a temperature of 5°C.

To the north the crest fell very steeply into a precipice; continuous perpetual snow with quite clear bedding descended on the northern side considerably further than on the southern one, by at least a hundred metres. The view from the top of the ridge onto its southern side was very extensive and delightful. In front of us, beyond the wide valley of the Chilik, there stretched the entire southern chain of the Zailiiskii Alatau (Kungei-Alatau), which bore on its northern slope an unbroken strip of permanent snow. It hid Lake Issyk-kul' from us, but beyond it in the distant south-east there was visible the snowy Tengri-tag with its distinctive giant, Khan-tengri. Below, at our feet the whole valley of the Chilik was covered with misty clouds. But in the south-west, at the junction of the Chilik and Kebin, which linked both chains of the Zailiiskii Alatau, snow-fields were sparkling.

We tried to carry out our descent from the high crest with the utmost speed, but when we reached the biggest part of this slope, it had already become dark, and we had to descend the steep rock wall, surrendering ourselves completely to the instinct of the Kirgiz horses, which were remarkably accustomed to mountain journeys. However, when at last we reached the foothills of the rocky wall from which we had been descending, we decided to spend the night there, without going as far as our camp at Mai-bulak.

<sup>1</sup> [Semenov:] The vegetation between the snowline and the upper limit of the forest was high alpine and consisted of the following plants: *Thalictrum alpinum*, *Ranunculus altaicus*, *Oxygraphis glacialis*, *Trollius patulus*, *Hegemone lilacina*, *Aconitum rotundifolium*, *Papaver alpinum*, *Corydalis gortschakovii*, *Draba lactea*, *Parrya stenocarpa*, *Chorispora sibirica*, *Viola grandiflora*, *Lychnis apetala*, *Bryomorpha (Arenaria) rupifraga*, *Alsine verna*, *Cerastium alpinum*, *Geranium saxatile*, *Oxytropis amoena*, *Astragalus vicioides*, *Dryadanthe bungeana*, *Potentilla nivea*, *Saxifraga flagellaris*, *Sax. hirculus*, *Chrysosplenium nudicaule*, *Sedum coccineum*, *Aster alpinus*, *A. flaccidus*, *Erigeron uniflorus*, *Gnaphalium leontopodium*, *Doronicum oblongifolium*, *Saussurea pygmaea*, *S. sorocephala*, *Primula nivalis*, *Pr. longiscapa*, *Cortusa matthioli*, *Gentiana aurea*, *G. kurroo*, *Arnebia perennis*, *Eritrichium villosum*, *Pedicularis dolichorhiza*, *Gymnandra borealis*, *Dracocephalum imberbe*, *Dr. altaicense*, *Oxyria reniformis*, *Polygonum viviparum*, *Luzula campestris*, *Carex atrata*.

On 25 July, having got up at five o'clock in the morning, out of curiosity we examined that rocky wall down which we had come, and it appeared to us that the descent would have been quite impossible. This proved to us that a horse's instinct is sometimes more reliable than the human eye. Having started on our journey along a far easier track, in about two hours we reached the place where our detachment had spent the night at Mai-bulak. That place, according to my measurement, was at an altitude of 2,360 metres.

We started our journey with my detachment before noon with the temperature at 22°C. Not far from my tent, situated among the firs, from under the rocks ran a beautiful spring, which was at 4.4°C. The fir-trees rose for another fifty metres above our camp. After the whole detachment had come out, we quickly climbed to a comparatively low pass, which was at 2,480 metres absolute altitude, with the temperature at 11°C.

From here we quickly began to descend diagonally across steep slopes, trying to get close to the deep valley of the river Dzhénishke. The rock outcrops which we met consisted of porphyry, while the vegetation zone through which we were passing was fir forest. When, having travelled for some fifteen *verst*s we came very near the river Dzhénishke, we began to descend quickly into its narrow gorge through cliffs consisting of siliceous schist, while on the left bank of the gorge cliffs of porphyry rose steeply.

There were very few meadow areas in the narrow valley, but the forest vegetation was rich. I give here a fairly complete list of flora of the Dzhénishke valley, based on our collection and journal for 25 July, because the difference between the parallel, and almost equally deep, valleys of the Chilik and Dzhénishke depended on the narrowness and proximity of the banks of the latter, and on the greater speed of the mountain streams falling into the Dzhénishke.<sup>1</sup>

Having reached the river Dzhénishke itself by about six o'clock in the

<sup>1</sup> [Semenov:] Here is a list based on the collection and written notes made on 25 July: *Atragene alpina*, *Thalictrum minus*, *T. simplex*, *Ranunculus polyanthemos*, *Trollius patulus*, *Aquilegia vulgaris*, *Delphinium caucasicum*, *Aconitum lycoctonum*, *Berberis heteropoda*, *Papaver alpinum*, *Arabis pendula*, *Draba muralis*, *Chorispora bungeana*, *Sisymbrium brassicaeforme*, *S. sophia*, *Erysimum cheiranthus*, *Capsella bursa-pastoris*, *Thlaspi arvense*, *Parnassia palustris*, *P. laxmanni*, *Polygala vulgaris*, *Silene inflata*, *S. saxatilis*, *Arenaria serpyllifolia*, *Stellaria glauca*, *Geranium saxatile*, *G. collinum*, *Impatiens parviflora*, *Euonymus semenovi*, *Caragana pygmaea*, *Astragalus hemiphaca*, *A. hypoglottis*, *A. alpinus*, *Vicia cracca*, *Lathyrus pratensis*, *Hedysarum obscurum*, *Spiraea hypericifolia*, *Sanguisorba alpina*, *Potentilla anserina*, *Rubus caesius*, *Rosa pimpinellifolia*, *Cotoneaster nummularia*, *Pyrus aucuparia*, *Epilobium angustifolium*, *E. palustre*, *Sedum purpureum*, *S. hybridum*, *Ribes heterotrichum*, *R. rubrum*, *Heogaya simplex*, *Archangelica decurrens*, *Lonicera xylosteum*, *L. hispida*, *L. microphylla*, *L. caerulea*, *L. tatarica*, *L. karelini*, *Asperula aparina*, *Galium boreale*, *G. verum*, *Valeriana officinalis*, *Scabiosa caucasica*, *Rhinactina limonifolia*, *Erigeron acris*, *Achillea millefolium*, *Tanacetum fruticulosum*, *Artemisia dracunculus*, *Art. scoparia*, *Art. vulgaris*, *Art. rupestris*, *Art. sacrorum*, *Gnaphalium leontopodium*, *Senecio vulgaris*, *S. praealtus*, *S. sibiricus*, *S. paludosus*, *Saussurea pycnocephala*, *Centaurea ruthenica*, *Carduus crispus*, *Cirsium lanceolatum*, *Tragopogon pratensis*, *Scorzonera purpurea*, *Crepis multicaulis*, *Campanula glomerata*, *Adenophora polymorpha*, *Cortusa matthioli*, *Gentiana amarella*, *G. aurea*, *Echinosperrnum microcarpum*, *Hyosciamus pusillus*, *Pedicularis comosa*, *Nepeta nuda*, *Dracocephalum imberbe*, *Dr. peregrinum*, *Leonurus glaucescens*, *Lamium album*, *Phlomis*



evening, we stopped here overnight on the very river bank with absolutely clear weather and a temperature of 27°C. Hypsometric measurement gave a height of 1,880 metres.

On 26 July we set off from our camp at five o'clock in the morning and immediately began going up the mountain steeply along the right side of the valley. But when on our way we came upon a transverse tributary valley of the Dzhenishke, the Chin-bulak, we descended into it through the fir forest and began to climb upstream, at first coming across outcrops of micaceous shales, and then of granites. In one place the granite appeared to be penetrated by a vein of greenstone, having a dip of 75° to the south. As we climbed up the stream, the fir forest was gradually becoming thinner and at last, when we reached the margins of the forest zone at a height of 2,600 metres, it gave way to *archa* (*Juniperus sabina*). Then the *archa* disappeared too, and we came out into the alpine zone, proceeding across which at eleven o'clock in the morning we finally reached the top of the pass, which according to my hypsometric measurement was 2,880 metres.<sup>1</sup> The thermometer registered 10°C.

The descent from the pass was very steep and very dangerous. It brought us to one of the upper reaches of the river Asy<sup>2</sup> namely the Asynin-bulak, which we reached at five o'clock in the afternoon with the temperature at 18.6°C. It was here that we stopped overnight, where a hypsometric measurement gave an altitude of 2,420 metres. The fir forest rose above our camp for about another 180 metres. The transverse valley of the Asynin-bulak in which we stopped discharged into the longitudinal valley of the river Asy.

On 27 July we started our journey from our camp on the Asynin-bulak at five o'clock in the morning and quickly descended into the wide longitudinal valley of the river Asy. Having turned along it upstream towards the west, and having

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*tuberosa*, *Plantago major*, *Chenopodium hybridum*, *Axyris amaranthoides*, *Rumex aquaticus*, *Polygonum cognatum*, *P. convolvulus*, *P. polymorphum*, *Euphorbia pachyrhiza*, *Salix purpurea*, *S. nigricans*, *Betula alba*, *Picea schrenkiana*, *Juniperus sabina*, *Goodyera repens*, *Allium atosanguineum*, *A. steveni*, *A. oreoprasum*, *A. oreophilum*, *Eremurus altaicus*, *Carex nitida*, *Triticum cristatum*, *Tr. repens*, *Festuca altaica*, *Atropis convoluta*, *Melica ciliata*, *Festuca ovina*, *Calamagrostis dubia*, *Cal. epigeios*, *Lasiagrostis splendens*, *Poa nemoralis*, *P. altaica*. Among these plants which I discovered, there was found a species of *beresklet*, which was very different from our European ones (*Euonymus europaeus*, *Eu. verrucosus*) and which later received the name *Eu. semenovi*.

<sup>1</sup> [Semenov:] Here is a list of the plants collected by me on 26 July in the alpine zone of the mountain pass leading from the valley of the river Dzhenishke into the valley of the river Asy: *Ranunculus pulchellus*, *Ran. altaicus*, *Callianthemum rutaefolium*, *Papaver alpinum*, *Barbarea vulgaris*, *Draba lactea*, *Dr. rupestris*, *Eutrema edwardsii*, *E. alpestre*, *Viola grandiflora*, *Parnassia laxmanni*, *Lychnis apetala*, *Alsine verna*, *Cerastium alpinum*, *Geranium saxatile*, *Oxytropis amoena*, *Astragalus hemiphaca*, *A. alpinus*, *A. nivalis*, *Dryadanthè bungeana*, *Sanguisorba alpina*, *Potentilla gelida*, *Saxifraga flagellaris*, *S. hirculus*, *S. sibirica*, *Chrysosplenium nudicaule*, *Libanotis condensata*, *Archangelica decurrens*, *Aster alpinus*, *Ast. flaccidus*, *Erigeron uniflorus*, *Tanacetum pulchrum*, *Gnaphalium leontopodium*, *Primula nivalis*, *Androsace septentrionalis*, *Gentiana falcata*, *G. aurea*, *G. kurroo*, *G. frigida*, *Myosotis sylvatica*, *Eritrichium villosum*, *Gymnandra borealis*, *Oxyria reniformis*, *Polygonum viviparum*, *Festuca altaica*.

<sup>2</sup> Kosharov, no. 126 (2).

travelled along it for about fifteen *verst*s through the forest zone, we came upon outcrops of porphyry only, and by about eight o'clock in the morning we had already reached the margins of forest vegetation, and quickly began going uphill across alpine meadows to the pass which separates the longitudinal valley of the Asy from the upper reaches of the river Turgen, which had long been familiar to us, and was by now flowing along the northern slope of the Zailiiskii Alatau into the river Ili.

Leaving the Asy valley, I had completed a study of the flora of all the main longitudinal valleys of the Zailiiskii Alatau, of which the two most significant (of the rivers Kebin and Chilik), stretching from east to west in one line, break up the gigantic range into northern and southern snow chains, while two others, parallel to them, but less significant longitudinal valleys (the Dzhenishke and Asy) represent as it were side folds, formed during the uplift of the two colossal parallel mountain chains.

Generally speaking, fragmentation into parallel chains and the formation of very long valleys stretching from east to west, parallel to the axis of the mountain range, constitute characteristic features of the Tian'-Shan'. In their geological structure all these longitudinal valleys have an evident similarity among themselves, but in climate and vegetation the valleys of the Zailiiskii Alatau were very different from those of the central Tian'-Shan'.

All four valleys of the central Tian'-Shan' visited and explored by me, (the Sary-dzhas, belonging to the Ak-su river system, and therefore to the Tarim and Lake Lob-nor; the valleys of the Kok-dzhar and upper Karkara, belonging to the Ili system and Lake Balkhash; and the valley of the upper Naryn, belonging to the Jaxartes or Syr-dar'ia system, and therefore to the Aral Sea) lie above the limits of forest vegetation, and hence are not suitable for agricultural colonization.

In contrast, all the four named longitudinal valleys of the Zailiiskii Alatau (of the rivers Kebin, Chilik, Dzhenishke and Asy) lie entirely within the forest vegetation zone, and hence are suitable for the agricultural colonization and especially for cattle-breeding. As regards the flora of these last four valleys, it has considerable peculiarities in comparison with the steppe, purely Asiatic, flora of the Ili lowland on one side and the high-alpine flora of the alpine zone on the other.

One of these peculiarities manifests itself in the fact that the proportion of vegetation types in these valleys belonging to arboreal species is incomparably more significant than in areas of the Trans-Ili territory, which belong to steppe, purely agricultural, and even more to the alpine zones, making up more than 20% of all plants in these valleys. In contrast to the herbaceous vegetation of the same valleys, among which the greater part belongs to European forms, the arboreal vegetation has a different character. Of thirty-six species of trees and shrubs encountered by me here, only seven were found to be common with our middle-

Russian plains vegetation, namely: birch (*Betula alba*), bird-cherry (*Prunus padus*), apple (*Pyrus malus*), rowan (*Pyrus aucuparia*), *ķumanika* (*Rubus caesius*), and our forest honeysuckle (*Lonicera xylosteum*) and red willow (*Salix purpurea*). The remaining arboreal species found by me in the Zailiiskii Alatau belong to forms alien to us, which have their centre of dispersion in the Central Asian upland, namely in Dzhungaria. Of them, nine are not found beyond the limits of Dzhungaria, but ten are common to Dzhungaria and the entire Altai-Saian mountain system, and two of them reach across the Siberian plain to sub-Arctic localities of Siberia and even European Russia; finally, eight species also appear in the Caucasus.

As regards herbaceous plants, of 175 species found by me in the longitudinal valleys of the Zailiiskii Alatau, 57% belong to ordinary species, widespread throughout our central-Russian plain, which merges imperceptibly into the Siberian plain, and only the remaining 43% may be considered to be more or less Asian plants, of which 19% are not found beyond the confines of the Dzhungarian upland, 12% are common to this upland and the Altai-Saian mountain system and must be considered native Siberian plants, while the other 12% spread over the Kirgiz steppes into the Aral-Caspian lowland and reach the foothills of the Caucasus.

The less important and narrower of the longitudinal valleys of the Alatau differ from the wider ones by the fact that with the greater steepness of their slopes the alpine streams reach the bottoms of these valleys faster and quickly bring with them the seeds of mountain plants from the alpine zone, which not infrequently develops in these valleys.

To return to my journey; on 27 July at about nine o'clock in the morning, proceeding uphill along the longitudinal valley of the Asy, I now left the limits of the forest vegetation and began to climb quickly up to the pass. Before midday we had already reached its top, which according to my hypsometric measurement was at 2,520 metres. The thermometer showed 12°C at noon. The slope to the other side of the pass brought us to the Oi-dzhailau stream, which turned out to be one of the tributaries of the river Turgen, which was already familiar to us. The vegetation on the pass itself and its slopes was alpine.<sup>1</sup>

Having entered the forest zone, we passed through it along the left incline by steep slopes, and crossing the left tributaries of the Turgen, at last reached the confluence of its two main branches, and at seven o'clock in the evening stopped here overnight among the luxuriant vegetation of the lower forest zone, which

<sup>1</sup> [Semenov:] This is what is recorded in my diary for 27 July in this zone: *Trollius patulus*, *Papaver alpinum*, *Draba hirta*, *Eutrema alpestre*, *Parnassia laxmanni*, *Cerastium lithospermifolium*, *Geranium saxatile*, *Astragalus alpinus*, *Sanguisorba alpina*, *Saxifraga hirculus*, *Sax. flagellaris*, *Libanotis condensata*, *Archangelica decurrens*, *Erigeron uniflorus*, *Aster flaccidus*, *Artemisia sericea*, *Gnaphalium leontopodium*, *Taraxacum steveni*, *Androsace septentrionalis*, *Gentiana falcata*, *G. frigida*, *G. aurea*, *Myosotis sylvatica*, *Oxyria reniformis*, *Carex atrata*.

consisted exclusively of deciduous trees: birch, poplar (*Populus laurifolia*) apple, apricot, and Trans-Ili maple (*Acer semenovi*); and of shrubs – buckthorn (*Rhamnus cathartica*) and argai (*Cotoneaster nummularia*), bereshket (*Euonymus semenovi*), cherganak (*Berberis heteropoda*), boiarka (*Crataegus multifida*) and honeysuckle (*Lonicera caerulea*). Of the herbaceous plants, *Echinops ritro*, with its light blue spheres, was the most striking. Apricot-trees and maples reached their upper limit here. The altitude of our camp was 1,280 metres.

On 28 July, having set out from our camp at seven o'clock in the morning, we descended along the Turgen and at eleven o'clock in the morning, at which time the thermometer registered 29°C, we reached the exit of this river into the foothills. Here we made a halt at the place where the altitude, according to my measurement, was 950 metres. Moving onto the plain, we turned along a familiar track to the west through the steppe foothills and travelling at full speed by six o'clock in the evening reached the outlet of the familiar river Issyk, by which we camped at an absolute height of 940 metres. In the twilight we made another traverse to the exit of the river Talgar from the mountains, where we stopped for the night.

On 29 July we moved off from our camp before eight o'clock in the morning and after a speedy journey returned to Vernyi, where the most cordial welcome awaited us. Almost the entire population of the town with all the authorities at their head, warned the previous day about the return of the Russian Geographical Society's expedition, was waiting for us in the town's main square, where in front of the church construction, which was making rapid headway, we dismounted from our horses.

Indeed, the first scientific expedition of the Russian Geographical Society to visit the young Russian territory, which had only just come into being beyond the river Ili in the heart of the Asian continent, excited universal and profound appreciation. Russian peasant settlers, who had already become sufficiently acquainted with the unusual spaciousness of the wonderful land, rejoiced that learned people had come to study their well-being and needs. Installed in Vernyi, the Cossacks, descendants of the companions of Ermak,<sup>1</sup> recognized our expedition as their own, not only because they were involved in immediate participation in it, but also because roaming in lands which were full of surprises, hitherto inaccessible, and on the whole unknown, to Russians it aroused in them memories of the heroic deeds of their forefathers at the time of the occupation of Siberia in the sixteenth and seventeenth centuries. Finally, the small numbers of intelligentsia of Vernyi, who were vitally interested in the future of the territory, treated very seriously the results achieved by the successfully completed expedition.

There was no end to the questioning from persons who regarded the future of the Trans-Ili territory with the greatest concern. Having familiarized himself

<sup>1</sup> Armstrong, *Yermak's Campaign*.

from my answers with the boundaries of the domains of the Bogintsy, whose acceptance into Russian citizenship would secure Russia's possession, not only of the basin of Lake Issyk-kul', but also of the entire northern slope of the gigantic Tian'-Shan' and of the Musart mountain passes, Colonel Peremyshl'skii, with his innate common sense and knowledge of the nomads' way of life, understood very well that the Sarybagish, who were hostile to us and were placed between two fires – between the Kirgiz, protected by the Russians from raids, and the nomads of the Kokand khanate, more powerful and unrestrained by anyone – would also follow the example of the Bogintsy very soon and would wish to become Russian subjects, as did the tribes which were part of the Middle and Great Kirgiz hordes, one by one, for the same reasons in the eighteenth century.

To Colonel Obukh, chief of Vernyi's artillery, as the most educated and sophisticated of the local intelligentsia, I decided to explain my opinion concerning the necessity, and even inevitability, in the near future of extending our state border from the long Orenburg-Siberian-Irtysh line to the line joining Vernyi, or rather the western extremity of Issyk-kul', to Fort Perovskii, the settlement situated on the lower course of the Syr-dar'ia. It seemed obvious to me that, in order to reconnoitre and occupy such a border line, an expedition should be equipped in the near future, and that to be a successful operation such an expedition should be sent from Vernyi and be based on the Trans-Ili territory.

I stayed in Vernyi for only three days. On the one hand, I was in a hurry to make use of the rest of the autumn in order to finish my scientific research in the Semirech'e district, exploring the interesting locality of Katu in the Ili plain, by visiting the flourishing Lepsinsk *stanitsa* in the mountain valley of the Semirechensk Alatau, and also visiting Lake Ala-kul' and the Tarbagatai range which keenly interested me. On the other hand, my further stay in Vernyi was useless, as by the third day after my return the town had already become immersed in its customary alcoholism, and it was only left for me to observe the reasons for and consequences of this sad phenomenon, which was so widespread in our outlying districts half a century ago. It seemed that the government endeavoured to combat this evil with fairly radical measures at least in our central Asian fringes. In newly inhabited Central Asia, the Semirech'e and Trans-Ili territories, not only the distillation, but also the importation, of alcoholic drink was prohibited. But to fight against the bootlegging of vodka by the local population of the territory was impossible. The enterprising Cossacks distilled vodka by the most primitive methods from raisins, which were brought in huge quantities on camels from Tashkent. Independently of that, the omnipotent tax-farmer, who was under the special patronage of the Chief Administration of Western Siberia, with members of which he so willingly shared his profits, despite the ban on importation of alcoholic drinks, sent caravans of his farmed vodka from all the *stanitsy* of the Siberian-Irtysh line across the Kirgiz steppe into the Semirech'e and Trans-Ili territories, to Aiaguz, Kopal and Vernyi. In Kopal and Vernyi a

bottle of this vodka cost three rubles, that is the price at which a bottle of champagne was sold in Petersburg and Moscow, yet this high price had not the slightest influence in the direction of cessation or restriction of drunkenness, while the very wealth of the young outlying Russian districts greatly promoted the consumption of alcoholic drinks, as the tax-farmer's saying was justified, namely that not only the stomach, but also the pocket, drank. Obviously, the ban on the distilling and importation of vodka into the territory did not appear to be a sufficient means in the battle against drunkenness, since it was impossible to carry out supervision of implementation of these bans due to the local circumstances in the country. Other, more subtle, measures were necessary for fighting alcoholism in our outlying territories.

I left Vernyi in my *tarantas* in the afternoon on 2 September 1857, and having crossed the first deep ravine by a beautifully constructed wooden bridge, I found myself in the Pri-Ili steppe, which at this time of year was turned by drought into an ashen-coloured dusty surface, on which there survived only groups of no more than six species of semi-arid plants, namely, liquorice (*Glycyrrhiza aspera*), another leguminous plant (*Sophora alopecuroides*), two species of wormwood (*Artemisia maritima*, *Ar. olivieriana*) and also two species of Compositae (*Echenais sieversii* and *Acroptilon picris*).

Built of excellent pine wood, the Almaty picket, half-way between Vernyi and Iliisk, had been adorned with a superstructure like a mezzanine, which served as a good observation point for the Ili plain. As we approached the banks of the Almaty, which was now calm and with little water, the vegetation livened up and became more diverse. On the damp soil the following plants were still in flower: of Ranunculaceae, *Ranunculus scelecratus*; of Malvaceae, *Althea officinalis* and *Alth. nudiflora*; of Leguminosae, *Medicago falcata*, *Trigonella polycerata*, *Melilotus alba*; of Compositae, *Onopordon acanthium*, *Cousinia tenella*, *Cous. platylepis*, *Heteracia scovitzii*; of Convolvulaceae, *Convolvulus arvensis*; of Boraginaceae, *Anchusa italica*; of Scrophulariaceae, *Verbascum speciosum*; of Plumbagineae, *Goniolimon speciosum*; of the *solianka* family, *Axyris amaranthoides*, *Atriplex laciniata*; of Gramineae, *Phragmites communis*, *Aeluropus litoralis*; and of the shrubs in bloom at that time of year, *Lycium turcomanicum*.

The sun was already setting when I left the Almaty picket, and the full moon was rising majestically above Turaigyr. At the foot of the Zailiiskii Alatau a little cloud of smoke marked a forest fire in one of the gorges of the range. Dry fog was forming a transparent haze in front of the range. The snowy summits of the Talgar group were still twinkling with their pink lustre and seemed to be small, although quite clear. With sadness I cast a farewell glance over that snowy upland of Central Asia, where, in the words of the great poet, there was found in the course of many years

'The longed-for peak of my heart's desires'.

Delayed at the Talgar ford by the difficulty of the crossing (we broke a shaft of the *tarantas* there), we reached the Ili picket only at the dead of night.

I used 3 September for an excursion to the steppe on the northern side of the river Ili. The arboreal vegetation between the Ili and Chingil'dy pickets consisted of the following trees and shrubs: *Populus euphratica*, *Pop. pruinosa*, *Berberis integerrima*, which was covered with beautiful round pink berries, *Eleagnus hortensis*, *Caragana frutescens*, *Car. tragacanthoides*, *Halimodendron argenteum*, *Rosa geblerriana*, *Hulthemia berberifolia*, *Tamarix elongata*, *Tam. pallasii*, *Tam. hispida*, *Stellera stachyoides*. Making an excursion, we reached the Chingil'dy picket only by three o'clock in the afternoon and here we examined an as yet unknown spring, the temperature of which turned out to be 13.2°C. From the middle of its circular basin water was gushing out forcefully. In the spring small fish, which looked like loach, were swimming. We left Chingil'dy at sunset and reached the Karachek picket when it was already night, and stayed overnight there.<sup>1</sup>

On 4 September we set out on our journey at dawn. We stopped half-way to the station of Kuian-kuz, and I made an excursion into the adjacent hills. The nearest of them, Arkaly, was only three *versts* away from the road, beyond the river of the same name. They consisted exclusively of porphyry and had an orientation from east-north-east to west-south-west. Having travelled from here across the undulating steppe as far as Kuian-kuz, we continued our excursion towards the small hill group of Mai-tiube, situated ten *versts* from here. I had already visited this group in May 1857 and here I had then found two new species of astragal, which subsequently received my name (*Oxytropis semenovi* and *Astragalus semenowi*) from the botanist Bunge; at that time of the year they had already finished blossoming.

From a distance my attention was attracted by the forms of two pointed knolls. The outcrops which I encountered on my way to the first of these knolls consisted of light red, striped porphyry with a green mineral interspersed in it; but the hill itself, rising on the bank of a river, consisted of very dark porphyry, which resembled basalt. Further towards the middle of the hill first a conglomerate was encountered, and then diabase. The second pointed knoll was already on the outskirts of the group, near the river's bend, and consisted of very dark porphyry.

From here we set out on our way back and passed diagonally through the

<sup>1</sup> [Semenov:] Here is the list of grasses which were still in a recognizable state (in bloom or with berries) on the Ili plain on 3 September, 1857: *Silene nana*, *Geranium divaricatum*, *Erodium semenovi*, *Tribulus terrestris*, *Aplophyllum sieversii*, *Orobis semenovi*, *Alhagi camelorum*, *Ammodendron sieversii*, *Karelinia caspia*, *Achillea trichophylla*, *Saussurea semenovi*, *Cousinia tenella*, *C. affinis*, *Amberboa odorata*, *Centaurea pulchella*, *C. squarrosa*, *Mulgedium tataricum*, *Cynanchum acutum*, *Convolvulus subsericeus*, *Conv. semenovi*, *Heliotropium europaeum*, *Nonnea picta*, *Linaria odora*, *Veronica nudicaulis*, *Lallemantia royleana*, *Lagochilus pungens*, *Eremostachys rotatea*, *Er. mollucelloides*, *Statice otolepis*, *Blitum polymorphum*, *Halostachys caspica*, *Salsola lanata*, *S. brachiata*, *Girgensohnia oppositifolia*, *Nanophytum erinaceum*, *Calligonum leucocladum*, *Atraphaxis spinosa*, *A. laetivirens*, *A. lanceolata*, *A. pungens*.

whole of Mai-tiube, having again come across outcrops of diabase and then of porphyry on our way. The vegetation was totally of steppe character, with small bushes of cherries (*Cerasus prostrata*) and beautiful, somewhat thorny *Acanthophyllum spinosum*, *Atraphaxis pungens*, *Atr. lanceolata*, as well as *Lallemantia royleana*, *Centaurea pulchella*, *Cent. squarrosa*, and *Ruta dahurica*.

After our interesting excursion to Mai-tiube, we reached Altyn-emel' by half past seven in the evening with the temperature at 19°C. A hypsometric measurement gave 1,120 metres of absolute altitude, and we spent the night here.

On 5 September we left on our journey early in the morning, travelling towards the Altyn-emel' Pass. The day was dry and hot, and the steppe presented an original sight. It was burning to the north-east of us for a distance of several square *versts*, and we had to pick our way carefully past the huge fire, so as not to get under the wind which was spreading it.

When climbing the mountain pass, the first outcrops consisted of shale, and afterwards we encountered outcrops of porphyry, which accompanied us up to the very top of the pass, the height of which according to my hypsometric measurement was 1,520 metres of absolute altitude. The plants which particularly caught my attention at the top of the pass were: of Labiatae, *Dracocephalum nutans var. alpina* and *Nepeta densiflora*; and of alpine shrubs, *archa* (*Juniperus sabina*).

Having crossed the pass, we descended from it along the small Altyn-emel' spring and then turned eastwards through the spurs, which were separated from the ridge. Among the rocks at first we came upon outcrops of diabase, and then of melaphyre. Near the track, I noticed projections of lead ore. When we finally came down, on the right, in the distance there came into view the Kalkan Mountains on the Chinese frontier, branching off from the extremities of the Katu Mountains, the goal of our journey.

The barren plains over which we were proceeding were covered with stones and boulders, among which syenite predominated. Having passed the river Bish-bulak, at which we also came across lead ores, we made for the isolated knoll of Bish-tau, which was remarkable for the fact that it consisted of porphyry, which had uplifted strata of siliceous schist, limestone and dolomite. In one place I noticed metamorphosed limestone. Further, across the Tiul'ku-bulak, the banks of which were overgrown with willow (*Salix viminalis*) and buckthorn (*Rhamnus cathartica*), we proceeded diagonally along a transverse valley, which retained the same barren character. But when we reached the Aino-bulak stream, the nature of the surroundings changed. The soil became fertile, and we saw here the excellent arable lands of my friend Tezek, on whose fields the millet crop was superb. It was here that we stopped for the night at half past seven in the evening. The temperature was 22.5°C. A hypsometric measurement gave 1,040 metres of absolute altitude. On the Alatau range, still glimmering even after sunset, there were visible belts and patches of snow.



On 6 September, after moving off from our camp early in the morning, we set out on our way by the Aino-bulak vale. The soil was less stoney than on the previous day, but all the same at that time of year it was rather poor in vegetation. I noticed only two species of wormwood (*Artemisia olivieriana* and *Art. maritima*) and *Peganum harmala*. In the steppe crawled many dangerous *ķarakurts*.<sup>1</sup> Here and there, salt-marshes were encountered. At last, the appearance of *chii* (*Lasiagrostis splendens*) and cereals marked the more fertile soil of a fairly extensive oasis, intersected by some streams, which had the name of Konur-uzen'. Among the shrubs growing here were *Caragana pygmaea*, *Car. tragacanthoides*, *Atraphaxis lanceolata*, *Atr. pungens*; and of halophytes, *Statice otolepis* and the *Statice* which was first found by me that day, already in a somewhat faded state, which later received my name as *Statice semenovi*. In addition there were *Halostachys caspica*, *Chenopodium botrys*, *Salsola lanata*, *Sals. brachiata*, *Sals. rigida*, and of the steppe grasses, *Althaea officinalis*, *Alth. nudiflora*, *Galatella punctata*, *Saussurea sp.*, *Salvia sylvestris*, and *Ceratocarpus arenarius*.

Soon after midday we arrived in the *aul* of Tezek himself, who welcomed me with great joy and introduced to me his whole family, including the little son, of whom he was especially proud, and on whose head he put the luxurious velvet hat of Kazan' manufacture, embroidered with gold, which I had given him and which turned out to be too small for Tezek's enormous head. It goes without saying that we spent the whole afternoon and the night in Tezek's luxurious *iurta*.

On 7 September we did not leave Tezek's *aul* until eight o'clock in the morning and made our way to the south-west from his pasture towards the mountains of Katu, which were quite near there. Having crossed the Kokterek stream, we traversed the whole fertile oasis of Konur-uzen' and turned abruptly into the Katu Mountains, which on their northern slopes consisted exclusively of porphyry. Their vegetation was totally steppe: steppe (non-creeper) convolvulus (*Convolvulus subsericeus*, *Conv. pseudocantabrica*, *Conv. semenovii*, *Eremostachys rotatea*, *Lallemantia royleana*, *Ceratocarpus arenarius*, *Atraphaxis lanceolata*, *Lasiagrostis splendens*). The outcrops consisted of very dark crystalline rock, like melaphyre, which uplifted slightly the layers of conglomerate.

Emerging onto the southern slope of the Katu Mountains, I found myself in a locality like *solfatara*. It was surrounded by conical hills, equal in size, which formed quite high groups in three places and which in places were ruptured on their southern side. These hills consisted of the same dark rock. I came across two *solfatara* holes, one at the north-eastern end of the mountain group, the other in the south-western corner. The fact that sulphur was produced here as

<sup>1</sup> *Lathrodectes tredecimguttatus*, a poisonous spider, widely found from North Africa, southern Europe and western Asia to Central Asia and as far as the Enisei.

sublimation in the form of steam from beneath the soil is proved by the sulphur-filled fissures, as at Pozzuoli,<sup>1</sup> by the formation of gypsum crystals in these fissures, and also by the influence of the sublimation of sulphur through cracks on the dark bedrock, which here became completely white. But the *solfatara* had apparently long since become extinct, and no exhalations appeared from anywhere, although the smell of sulphur was perceptible from a distance when approaching the extinct *solfatara*. Of course, the whole chemical process which had once taken place here could be explained by prolonged underground fires in the coal strata which were so widespread higher in the Ili valley.

Having crossed the *solfatara* diagonally, I found south-west of it an outcrop of a quartz vein with haematite. In front of us there rose a small knoll, which had the name of Ak-tau (White hills) due to its colour, like that of the whitened rock of the *solfatara*. In the Ak-tau there were deposits of alum, and of sal-ammoniac, so the local Kirgiz claimed. Everywhere here the Chinese had left traces of workings in their exploration for sulphur, alum and ores, which according to their testimony were of iron and silver-lead, just as in Kalkan.

Further along our route the vegetation apparently changed, but it had already become so dry and faded that I could not determine the nature of the vegetation complexes and could only identify a few species of plants, among which I noticed a pale yellow *Statice semenovi*. About five *versts* to the north-east of the *solfatara* we came across some excellent wells with water, picturesquely shielded by fresh tall reeds (*Phragmites communis*) and *Eragrostis poaeoides*. The autumn entomological fauna of this locality appeared to me to be quite rich; over the stones, *inter alia* there were crawling beautiful coleoptera of the genus *Prosodes*. From a distance we saw herds of fleet-footed *kulan* (*Equus hemionus*)<sup>2</sup> and *saiga* (*karakuiruk*).<sup>3</sup>

The Katu group rises slightly above the Konur-ulen' plateau. In the distance beyond Ak-tau the broad ribbon of the river Ili was glimmering, and beyond it the jagged profile of Boguty mountain was visible. Late in the evening we returned from our trip into the Katu mountains for our overnight stay in Tezek's *auly*.

On 8 September we left Tezek only after midday, having taken final leave of him, and having crossed the rocky Konur-ulen' plateau, reached the foot of the Alaman mountains and stopped here overnight by the exit from the mountains of the river Karakol.

<sup>1</sup> Pozzuoli *solfatara*, west of Naples, visited by Semenov in 1854. The phenomenon is named after a volcano in the Campi Flegrei, emitting only steam and sulphurous gas.

<sup>2</sup> Isolated individual *kulan* are found to this day between the rivers Ili and Karatal (V. N. Shnitnikov. *Mlekopitaiushchie Semirech'ia* (*The Mammals of Semirech'e*), 1936, p. 148 (L.B.); Knystautas, *Natural History*, pp. 187-9.

<sup>3</sup> According to Shnitnikov, p.127, a different local antelope, the *dzheiran*, was called *karakuiruk*. Both *saiga* and *dzheiran* are found to this day to the south of Balkhash. (L.B.)

On 9 September, early in the morning, we climbed the mountain by the Karakol. The first outcrops which we met consisted of light grey diorite porphyry. Following the Karakol upstream, gradually we entered a waterless transverse valley in the Alaman range and proceeded along it towards the east-north-east. From here we saw the first spruce forest, which we encountered on the southern slope of the ridge, but it huddled on the slopes of a longitudinal valley, which was facing north. Then we came out to the river Bukon, which is formed here by the confluence of two branches, and followed the eastern branch to its crest. All the outcrops on our way consisted of diorite porphyry.

Further on we turned somewhat to the north-east, crossing the upper reaches of the rivers which were flowing eastwards, and started going up a slope of crystalline rocks, which had uplifted the gigantic strata of sedimentary rocks, namely, siliceous schist, with a dip of  $45^\circ$  to the south-east.

By easy passes we reached the culmination of the whole mountain pass across the Alaman Range, which, according to my hypsometric measurement, was 2,470 metres in altitude. All the outcrops at the pass consisted of red porphyry.

To the east-south-east, the view of the blossoming Chinese Ili province with its settlements immersed in the verdure of trees right up to Kul'dzha, was extensive and ravishing. In the transparent atmosphere the course of the Ili showed up as a light-coloured ribbon. Beyond this stream the clear air enabled us first to make out the Nan'-shan', that is the foothills of the Tian'-Shan', and then a row of clouds marked the alignment of the Tian'-Shan' itself at the place where the Musart Pass is situated.

Having looked around from the top of the pass, we began to descend quickly to its northern side, following along the river, which below its upper reaches was accompanied by spruce forest, at the lower boundary of which we had our afternoon snack. From here we emerged into the longitudinal valley, formed by the upper river Borokhudzhir and bearing the name of Saz. All along its descent all the rock outcrops consisted of syenite. With its considerable width, gentleness of slopes and constancy of direction from east to west, the Saz valley was slowly rising.

Having passed the sources of the Borokhudzhir, we found ourselves at the Iugentash Pass, the absolute altitude of which was 1,880 metres according to my hypsometric measurement. At two o'clock in the afternoon the thermometer registered  $17^\circ\text{C}$ .

At first we came down from the pass along the river Kesken-terek, but then the river deviated from us to the left, and we did not come to it again, but walked over the hill-side, without leaving its longitudinal valley, and crossed its three tributaries, which were called Uch-su.

During the whole of our journey over the Iugentash Pass we saw beneath us extensive patches of perpetual snow, and the vegetation was totally alpine;

among other plants the alpine poppy (*Papaver alpinum*) was particularly striking. We descended the wide longitudinal valley by gentle slopes, having constantly in sight the winding ribbon of the Kesken-terek at the bottom of the valley, but eventually we turned more to the right of the isolated Argal-tiube knoll, and just five *verst*s short of the low Agan-katy Pass, we spent the night in the *auly* of the Suvan tribe of the Great Horde.

Early in the morning on 10 September we moved to the *auly* of our old friend Adamsart, five *verst*s away from us, and only after midday resumed our journey, crossed the Agan-katy, came out to the river Kok-su and by evening reached the Dzhangyz-agach picket.

On 11 September at half past eight in the morning I was already at the Karatal, where, with the temperature at 18°C, I determined the height of the Karatal valley to be 670 metres.

On 12 September I returned to Kopal, where I spent three days, having calculated the altitude at the square in Kopal to be 1,020 metres. I had a most enjoyable meeting with Colonel Abakumov, and he rendered me a considerable service by sending my heavy *tarantas* with all my collections by the post road to Semipalatinsk, and by arranging for me a scenic route in the lightest possible carriage through the flourishing Russian settlements in the northern part of Semirech'e, Lepsinsk and Urdzhar.

My dear friend, the artist Kosharov, who had accompanied me throughout my entire Tian'-Shan' and Trans-Ili travels of 1857, and endured all the labours and dangers of the journey with remarkable selflessness, was in a hurry to return to Tomsk in time for the beginning of teaching at the *gimnaziia*; he parted from me and went in my *tarantas* by the post road as far as Semipalatinsk so as to reach Tomsk from there by post-chaise. Seeing him off on 15 September, I transferred that day from Kopal to Arasan.

On 16 September, early in the morning, I left Arasan through Keisyn-auz. While crossing the Biën, I noticed a plant which I had not seen hitherto, a type of *rogoz* (*Typha stenophylla*). At Keisyn-auz itself I noticed whole thickets of wild dwarf cherry-trees (*Cerasus prostrata*).

The altitude of the pass, according to my hypsometric measurement, was 1,160 metres, higher than Arasan by only 210 metres. But the descent to the northern side was incomparably longer, and at the end of it the Lepsinsk road diverged from the main Semipalatinsk highway. About seven *verst*s from the parting of the ways we came to the river Ak-su. Our road was passing across the steppe from west to east along the foot of the range. A strong westerly wind, blowing since the morning, was bowling along completely dried stems of various plants, known here as 'tumble-weed', among which I noticed *Ruta dahurica*. All the vegetation was burnt and faded. There had been no rain here since 15 June. At the river Ak-su beautiful Kirgiz horses were harnessed for us, and we sped across the hummocks and ditches. In the river Ak-su I noticed boulders of

schist and granite. Beyond the river the steppe did not change its character for about twenty *versts* to the river Baskan and for another ten *versts* to the Sarkan. It was covered with tall faded vegetation of once luxuriant grasses, among which I noticed characteristic types; *Althea*, *Sophora alopecuroides*, *Salvia sylvestris*, *Lasiagrostis splendens*.

The Sarkan, like the Ak-su and the Biën, emerged from a narrow gorge in the not very high Arasan chain, which represented a fairly regular crest, extending from west to east. But beyond the Baskan there now stood out the mountains which form the *glacis* of the main Alatau range, extending from west-south-west to east-north-east. The Baskan is a fairly sizable wide river, swift and tortuous, edged with a whole line of boulders, which mainly consist of granite. Among the plants on its banks I noticed bushes of *Atraphaxis lanceolata*. Here we changed our horses again and continued our journey across very hilly country. For the most part the hills were covered with deposits overgrown with faded turf. Here and there near the road, outcrops of argillaceous schist with an unclear orientation appeared at the surface. It had already begun to grow dark by half-way, and it was already night when we reached the place of our overnight halt by the river Terekty. The westerly wind, which had been blowing all day, at last erupted as a storm with heavy rain. The night was cold, and it was impossible to pitch a tent. The Cossacks fell asleep by the bright fires, which had been lit by a wealthy wedding convoy, travelling to Kopal for a marriage ceremony from Chubar-agach (Lepsinsk), where there was no priest.

During the second half of the night of 17 September the stars began to shine. The morning was frosty, but there was little hoar-frost. The river Terekty, by which we had spent the night, was flowing through a shallow foothill valley, less than half a *versta* wide. In the valley there was a grove of ancient, but quite widely spaced, poplars (*Populus laurifolia*), of which one could count no more than two or three hundred.

The view across the valley to the snowy *belki* of the Semirechensk and Dzhungarian Alatau, which closed it, was very beautiful. The fields of perpetual snow had become greatly expanded overnight due to freshly fallen snow. Even the day-time temperature was low.

We left our camp early in the morning. Our path lay over hilly, almost mountainous terrain; but we encountered very few rocks. Such outcrops as there were consisted of siliceous schist, changing to hornblende with very indistinct bedding. The vegetation had already faded considerably, but some of the steppe grasses were still flowering, for example, *Berteroa incana*, *Althea officinalis*, *Tanacetum fruticulosum*, *Saussurea coronata*, *Salvia sylvestris*, *Nepeta ucranica*, *Sal-sola affinis*. In the distance, here and there on low foothills, one could see forest. These foothills screened the main snow chain.

After a few easy passes, about twenty *versts* from our camp on the Terekty, we began to descend into the valley of the river Lepsa, and at last saw Chubar-agach,

or Lepsinsk, settlement, situated at the confluence of the two branches which formed this river in the longitudinal valley of the Semirechensk Alatau, having the form of an elongated ellipse about twelve *versts* long and up to seven wide, closed in by mountains on all sides. The main axis of this ellipse was aligned from the north-east to the south-west. Flowing together, both rivers originated in the high chain which bounded the elliptical valley to the south-east, but after their confluence the joint river (Lepsa) forced its way through the wild gorges of a less high chain, which bounded the elliptical valley to the south-west. In 1857 the road through this gorge did not exist; it passed through a not too high treeless pass in the north-western chain. The south-eastern chain, however, higher than the north-western one, had snowfields on its summits and its flanks facing the valley, at the bottom of which there was located the Lepsinsk settlement, and which was covered with various deciduous woods, bearing the entirely justified name of Chubar-agach ('motley forest'), especially in its marvellous autumn attire.

On the whole, the Chubar-agach valley is a locality which, although not as grand as the valleys of the Tian'-Shan' and the Zailiiskii Alatau, is no less attractive than the best valleys of the French Vosges and the Hardt in the Bavarian Pfalz, with which they have a great similarity in their autumn attire. A hypsometric measurement gave 820 metres of absolute altitude for the bottom of the Chubar-agach valley. Lepsinsk was quite well built of aspen timber, and only the window-sills and door jambs were made of spruce. In 1857 in Lepsinsk settlement there were in all 440 houses, and of the inhabitants there were

	males	females	total
Cossacks.....	407	356	763
Peasants.....	751	702	1,453
	<hr/>	<hr/>	<hr/>
	1,158	1,058	2,216

The settlers of this Russian colony in Central Asia, both peasants and Cossacks, were extremely contented with the climatic conditions of the country, and specially with its spaciousness and fertility, though being unaccustomed to the local climatic conditions, illnesses were frequent at the beginning. But these diseases depended mainly on the conditions, which were inevitably related to the process of colonization itself. The predominant ailments – scurvy, dysentery among children, and fever – were particularly caused by poor adaptation to local conditions, the absence of a roof over their heads in a climate which was rather rainy and subject to sudden changes in temperature, inadequate medical help, poor care of children during the initial strenuous field and construction work, and the misuse of fruit and berries.

In 1857 at the Lepsinsk settlement there were already occupied under crops

105 *desiatiny* of winter grain (rye), 753 *desiatiny* of spring grain (wheat 245 *desiatiny*, *iaritsa* 210 *desiatiny*, oats 194 *desiatiny*, barley sixty *desiatiny*, millet twenty-five *desiatiny*, peas nineteen *desiatiny*). Moreover, there were thirty *desiatiny* under crops of flax and one *desiatina* under hemp. During the previous three years the yields of these winter and spring crops were as follows: millet forty-fold; wheat from fifteen- to twenty-fold; *iaritsa* from twelve- to fifteen-fold, oats from six- to ten-fold. The yields of flax and hemp were also excellent.

Having a fairly rainy climate, particularly during the first half of the summer, cereal crops in the Chubar-agach valley did not need irrigation, but with watering (never more than once during the whole summer) gave more grain. Forage for livestock was incredibly good, as grass grew here no less luxuriantly than in the best Altai valleys. Only some vegetables, namely cucumbers, water-melons and melons, did not ripen due to early hoar-frosts, the only defect of the beautiful climate of the Chubar-agach valley. During the entire time of my visit to this valley (in the first half of September 1857) the temperature in the mornings was low and hoar-frosts had begun already by the beginning of September.

On 18 September from early morning I undertook an excursion on horseback into the mountains, accompanied by two Cossacks who were well acquainted with the district, having made my way to the very same mountain pass by which Karelin ascended the Semirechensk Alatau in 1840.

Our ascent began just one *versta* away to the south-east from the *stanitsa*. The entire mountain slope was covered with beautiful deciduous forest (*chubar-agach*), which included the following trees and shrubs: aspen (*Populus tremula*), poplar (*Populus nigra*, *P. laurifolia*), birch (*Betula alba*), several types of willow (*Salix pentandra*, *S. fragilis*, *S. alba*, *S. amygdalina*, *S. purpurea*, *S. viminalis*, *S. stipularis*, *S. capraea*, *S. sibirica*), wild apple (*Pyrus malus*, *P. sieversii*), rowan (*Pyrus aucuparia*), bird-cherry (*Prunus padus*), and of the shrubs there were two types of *boiarka* – red and black (*Crataegus sanguinea*, *C. melanocarpa*), *argai* (*Cotoneaster nummularia*, *Potentilla fruticosa*), raspberry (*Rubus idaeus*), wild gooseberries and currants (*Ribes aciculare*, *R. heterotrichum*, *R. rubrum*), buckthorn (*Rhamnus cathartica*), Siberian acacia (*Caragana frutescens*), species of honeysuckle (*Lonicera tatarica*, *L. xylosteum*, *L. hispida*, *L. caerulea*, *L. microphylla*), guelder rose (*Viburnum opulus*), and *cherganak* (*Berberis heteropoda*). Here and there thickly growing trees were heavily intertwined with local lianas; species of clematis (*Clematis orientalis*, *Atragene alpina*) and hop (*Humulus lupulus*). There was no coniferous forest in the *chubar-agach*.

Climbing in a southerly direction, we crossed a small spring, which the Cossacks called Beremesev, and five *versts* away from the *stanitsa* we came out at a bigger tributary of the Bol'shaia Lepsa, along which tree-felling was being carried out. The outcrops of rock which I came across on my way, consisted of greywacke schist with an indistinct bedding and which barely came out onto the surface of the ground. By the tributary of the Bol'shaia Lepsa there were also

found coniferous trees (*Picea schrenkiana*). In the upper reaches of this tributary we began to climb steeply, at first towards the south-east, then gradually turning at first to the east, and finally to the north-east. The mixed forest (*chubar-agach*) was gradually replaced by grasses, albeit faded, yet surpassing a mounted horseman in height. These grasses belonged to the families of Malvaceae (*Althea ficifolia*), Umbelliferae (*Sium lancifolium*, *Bupleurum aureum*, *Bupl. exaltatum*, *Conioselinum fischeri*, *Ferula soongorica*, *Anthriscus sylvestris*, *An. nemorosa*, *Conium maculatum*, *Schrenkia vaginata*), Compositae (*Inula helenium*, *Lappa tomentosa*, *Cirsium heterophyllum*, *Cirsium arvense*, *Onopordon acanthium*), and Gramineae (*Dactylis glomerata*, *Elymus sibiricus*, *Deschampsia caespitosa*, *Calamagrostis sylvatica*, *Milium effusum*, *Lasiagrostis splendens*). Here and there these grasses were very much entwined with mouse-pea, which reached their tops. Sometimes the luxuriant thickets of grass alternated with small groves of trees, of which the small apple-tree groves looked like orchard plantations; at this time of year the apples had already fully ripened and we thought that they were very tasty.

During our further ascent the schist was suddenly replaced by granite, at first small-grained, appearing at the surface like a rod, and then by coarse-grained, too. Deformed fir-trees still clung to flat rocks, but later forest vegetation finally disappeared. Of the shrubs there were growing *Potentilla fruticosa* and *archa* (*Juniperus sabina*), which was creeping over the flat rocks. But these level rocks were soon replaced by ones sticking out sharply like teeth, or books stacked vertically.

Our path, having climbed onto the crest which separates the tributary of the Lepsa from its main stream, went further over easy passes, winding between rocks almost at the same level, rising only a little. Moreover, here the vegetation was totally alpine, and, although it was now very faded, nevertheless I was able to distinguish some plants, such as *Papaver alpinum*, *Alsine verna*, *Cerastium maximum*, *Ledum gelidum*, *Arnebia perennis*, *Aster alpinus*, *Ast. flaccidus*, and four species of gentian (*Gentiana aurea*, *G. frigida*, *G. macrophylla*, *G. verna* and *Dra-cocephalum altaense*).

As we were walking forward between the rocks we encountered more and more piles of fresh snow, well compacted by the snow-storm. The wind was unbearable due to its strength and cold-ness. We had to turn to the west, and even to the north-west, in order to reach the slope to the main Lepsa, and thus came out again from the granites to the schists, the orientation of which was very clear this time, and the dip was almost vertical ( $85^{\circ}$  to the north-west).

From here a beautiful view of the highest part of the Semirechensk Alatau unfolded before us. It was exactly here that the upper valley of the Lepsa, while turning for almost ten *versts*, changed its direction. First it was aligned from west-north-west to east-south-east at right angles to the axis of the ridge; here, however, it then turned almost at a right angle and started to flow from the



south-south-west to the north-north-east, that is almost from the south to the north, lengthwise relative to the orientation of the schists. At the head of the valley there was the biggest *belok*, and from it a wide snow cloak was coming down towards two or three sources of the Lepsa. The upper longitudinal valley of the Lepsa was little more than a *versta* wide, its slopes were gentle, and the bottom was overgrown with spruces, albeit rather widely spaced, since forest vegetation had already reached its limit here. Across the valley the river Lepsa meandered like the Chilik, but when this river turned at a right angle, it forced its way through the transverse valley, and it was here that it made its way across the direction of the schists in overhanging cliffs, between which, when encountering obstacles, it formed a lake. That is why, although there is a mountain pass to China in the upper reaches of the Lepsa, local residents prefer to get there through the high mountains and passes, going all round the upper valley, which was considered to be inaccessible in 1857.

My resolve to reach the Chinese side through the Lepsinsk Pass was not crowned with success. Having satisfied myself with my own eyes that the mountain pass was covered with snow at that time of year, and the weather would continue to be unfavourable, I decided to turn back.

There was no need to descend to the upper Lepsa valley, and we returned along the same path up which we had come. It was getting dark when we reached the granite protrusions, and by now in the darkness of night we came down as far as the first small spring, where we stayed overnight in a beautiful grove, consisting of birches, aspens and apple-trees. This pass was the very same one through which Karelin had gone in 1840.

On 19 September in dull weather, we returned to Chubar-agach by the same route. From the mountains the settlement looked like a chess-board. One could see how the rivers, flowing together beyond the *stanitsa*, forced their way through the frontal mountain ridge in a wild gorge after their confluence. In my time there was no track in this gorge, and it was impossible to get to Chubar-agach from the west, other than over the not very high ridge. In Chubar-agach itself the last snow falls only in December, and on the western slope even later, and it lasts only until March. During this time of the year good sleigh weather sets in; generally, the winter is very mild, and there is no serious cold weather at all.

Having spent the night at Lepsinsk *stanitsa*, I decided to leave it on 20 September. When I awoke between six and seven o'clock in the morning, I was quite taken aback by a totally wintry scene. Everything around was covered by thick hoar-frost. The grass was not visible, except for tall cereals (*Dactylis*, *Calamagrostis*, *Lasiagrostis*), but even their spikes hung down under the weight of the hoar-frost, which completely whitened even the laurel-leaved poplars. Thick fog did not enable one to distinguish objects further away than twenty paces. Nevertheless, we started on our journey, and having travelled for two *versts* across the valley, we quickly began to go up its slope in a westerly direction.

Along this route a wonderful sight was awaiting us. The fog rapidly began to thin and terminated abruptly almost like a wall, beyond which the sky was already clear and transparent. From the top of the pass not a single cloud was visible, the sun was shining warmly and brightly, and the thermometer showed 12°C at eight o'clock in the morning. The snowy summits of the Semirechensk Alatau were completely cloudless and were shining brightly in the sun's rays, which also beautifully illuminated the slopes of the forest zone in its motley autumn attire of *chubar-agach*. Not a single dew-drop could be seen on the still fresh grasses of the mountain pass. But at our feet in the Lepsa valley the whole wide elliptical hollow twenty *versts* long and seven *versts* wide was a real *mare vaporum*. Its colour was milky-greyish-white, similar to the colour of cumulus clouds. At first it was slightly undulating, but from the very top of the pass its surface now appeared absolutely horizontal. Not a single spot was visible on this milky sea, and nothing in it revealed its nature.

The same hot sun and the same atmospheric dryness accompanied us not only during our ascent to the top of the pass but also during our descent from it into a low dale, during which time we were approaching closer to the Lepsa, as it broke out from the gorge and wound like a beautiful ribbon across the dale. On the right bank of the river an extensive area was occupied by the Chubar-agach arable lands, and on the left bank in a slightly hilly locality, in an area of between four to five square *versts*, was a huge black patch caused by the fire which had occurred the previous night. That night the wind was south-westerly, it forced the fire to the Lepsa, but stopped on its terrace bank. Only in one place did it break through down to the river-bed, but even here it was stopped by the river waves. I drew my accompanying Cossacks' attention to the fact that the arable land occupied by them on this slope was especially suitable for melon-growing (water-melons, melons and cucumbers) as early hoar-frosts did not occur here at all. The bedrock which I encountered while descending along the north-western slope was greywacke. It appeared at the surface as low rocks without clear direction. The vegetation had become yellow and faded, but what struck me most of all here were *Astragalus sieversianus*, *Althaea officinalis* and *Dipsacus azureus*.

Having come down from the mountains, we turned towards the north across a hilly locality. The entire passage across the range was ten *versts* long, and while coming down from it, we also travelled for another twenty-five *versts* up to the river Chinzhalı. Gradually descending from the hills, we reached this river, which was fairly narrow and shallow, and crossed onto its right bank, ten *versts* below the river Kuiandy's discharge into it. Then about five *versts* further we came out to the lands of Kyzyl-dzhar, where our *iurty* were erected and a change of horses had been arranged. Ahead in the distance we could see the valley of the river Tentek. The ridge which divided the rivers, and which was becoming lower, ended here. From here, having deviated to the left of the arc, described in this place by the river Chinzhalı, we set out along its span across quick-sand hills

towards the Saukan Mountains, meeting on our way considerable thickets of beautiful red, steppe eglantine (*Hulthemia berberifolia*).

On 21 September we left the Saukan camp at six o'clock in the morning and for about five *versts* at first followed the *aryki* and arable lands of the Kirgiz, and then over sand-dunes, just like those in the Balkhash basin between the Dzhuuz-agach and Arganat picket. They have the same vegetation, consisting predominantly of the *Stace* species (*St. gmelini*, *St. myrianthe*) and generally of halophytes,<sup>1</sup> for which there was a real kingdom in the Ala-kul' basin in the steppe extending between the Alatau and Tarbagatai mountains. We walked over these dunes for about ten *versts*, and then crossed a saline plain along a good smooth track, and, at last, saw before us the vast flat-shored Lake Ala-kul',<sup>2</sup> in the south-eastern corner of which there rose the peninsular *sopka* Aral-tiube, which jutted out into it.

Approaching the reeds which edged the flat shores of the lake for about five *versts*, we came upon Kirgiz herds, changed horses, and having turned to the west, drew near to a narrow bay of the lake on which were swimming a huge number of ducks and swans. From the north-east the wind was blowing with incredible force. It was the famous *iui-be*, about which Chinese chronicles recounted that it blew periodically from an island in Lake Ala-kul' (Aral-tiube), overturned *iurty* and carried away livestock and people into the lake. Indeed, we satisfied ourselves that on the day of our arrival it was impossible to travel towards the lake by the coastal track and had to start making a detour.

From our camp at Saukan to the reeds we travelled for about thirty-five *versts*, from the reeds to the ford across the Ala-kul' bay, twenty *versts*. At two o'clock in the afternoon our thermometer registered 16°C. A hypsometric measurement gave the absolute altitude of the lake as 240 metres. The ford was quite deep, and we carried all our baggage on horseback. The water in the western Ala-kul' was fresh. We travelled for about another fifteen *versts* across the isthmus, which separates the Malyi or Western Ala-kul' from the Bol'shoi or Eastern one, and reached the wells where we found the *auly* in which we spent the night.

My acquaintance with the extensive lake basin of Ala-kul' only confirmed what had been thoroughly elucidated for the first time in 1840 by Alexander Schrenk, the explorer of the Semirechensk Alatau and the adjacent lake basins of

<sup>1</sup> [Semenov:] Here is a list of the plants of the *Salsolaceae* family which were growing in the local steppe: *Chenopodium acuminatum*, *Kirilowia eriantha*, *Camphorosma ruthenica*, *Kochia arenaria*, *Echinopsilon hyssopifolium*, *Chorispermum orientale*, *Salicornia herbacea*, *Kalidium foliaceum*, *Halocnemum strobilaceum*, *Schanginia linifolia*, *Suaeda physophora*, *Horaninovia minor*, *Salsola kali*, *S. rigida*, *Haloxyton ammodendron*, *Anabasis aphylla*, *Brachylepis salsa*, *Nanophyton caspicum*, *Ofaiston monandrum*, *Halogeton obtusifolium*, *Halocnemis crassifolia*, *H. sibirica*.

<sup>2</sup> Ala-kul' (Kirgiz name for Pestroe ozero, 'mottled lake') 96 km east of Lake Balkash in lowland steppe between the Tarbagatai and Semirechensk Alatau. At the turn of the century the eastern lake, Aish-kul' had a surface area of 2045.6 square km (59 km long by 43 km wide) and was little more than four metres deep. The western, Sassyk-kul', was 43 km long by 16 km wide. Both were brackish but sustained small quantities of fish.

Balkhash and Ala-kul'. In our time (1840–1858) the Ala-kul' lake basin consisted of two main lakes – the Eastern and the Western. They were divided by a marshy isthmus, about twenty *versts* wide, partly overgrown with reeds and dotted with small lagoons, which were connected by a channel. At some times of the year and in some years, the isthmus becomes impassable and is flooded to such an extent that both lakes more or less merge into one. It is self-evident that, with the low-lying lake shores, for the most part overgrown with reeds, and with a significant fluctuation of its level from year to year, and at different times of the year (depending on changes in the quantity of waters brought in by tributaries, and on the amount of evaporation), the very outlines of the lake, as of all lakes on the Kirgiz steppe, could not be defined with accuracy, and the surface of each of the two lakes could be indicated approximately, namely of the Eastern lake (fifty-five *versts* in length and forty *versts* in width) to be 1,500 square *versts*, and of the Western lake (forty *versts* long and fifteen *versts* wide) no more than 560 square *versts*. To the left from the Western Ala-kul', in the direction of the north-western extremity of Balkhash, there stretches the sandy and saline belt of Aitaktyn-karakum, which marks a trace of the previous union of the Balkhash and Ala-kul' basins, of which the latter represents as it were the separated (dried-up) extremity of the former.

The Ala-kul' basin differs from all the other numerous lake basins of the low-lying Kirgiz steppes by the fact that from its bottom, or from the low-lying shores, there rise high insular or peninsular *sopki*, bearing the name of Aral-tiube ('the insular mountain'), well known to all those who at some time have passed by Lake Ala-kul'. This circumstance enables one to define more precisely some interesting old historic routes, even of the thirteenth century. Thus, undoubtedly, the Armenian Tsar Hetum, who in the thirteenth century went cap in hand to the Chingiz-khanids to their famous capital of Karakorum, situated in Mongolia near the present borders of the Trans-Baikal region, passed by Lake Ala-kul', as he mentions a lake with a high island, and he could not have come across another one like that anywhere along his route from the Caspian Sea across the entire Aral-Caspian lowland. Thus, the tributaries of the Chingiz-khanids, the Armenian and Caucasian sovereigns, went around the Caspian Sea and through Turkmenia and Turkestan, passed by Lake Ala-kul' and came into Mongolia through those gates of human migrations from upland Asia, which are situated between the Dzhungarian Alatau and Tarbagatai. In contrast, all the Russian princes, for example, Iaroslav Vsevolodovich (Alexander Nevskii's father) and Alexander Nevskii himself, proceeded to Karakorum through the Golden Horde on the Volga along the Irtysh line and entered upland Asia through the Zaisan gates, that is between the Tarbagatai and Altai.

Information about Lake Ala-kul' is found already in Chinese sources beginning with the chronicles of the Yuan (Mongol) dynasty,<sup>1</sup> and it was from there

<sup>1</sup> For the Yuan (Mongol) dynasty, see Grousset, *Rise and Splendour*, pp. 222–47.

that they became known to European geographers (Ritter and Humboldt). The variegated lake (Ala-kul') with the high island *sopka* (Aral-tiube), the strong winds (*iui-be*), blowing constantly in one direction from Aral-tiube, particularly excited the curiosity of Humboldt, who perceived probable signs of volcanic phenomena both here and in Chinese descriptions of the environs of the town of Kucha<sup>1</sup> in the Tian'-Shan'. That is why Karelin, the first Russian traveller who visited Ala-kul' in 1840, applied valorous efforts in order to settle the question of the volcanic nature of Aral-tiube island. He brought with him a small boat from Zaisan, got to Aral-tiube island, and having achieved his purpose, obtained negative results. The conical island turned out to consist of porphyry, but no volcanic rock was found either on it or among the coastal boulders of the lake; only here and there among these boulders there appeared pieces of coal.

Seventeen years later my explorations in the Katu hills in the Ili valley and all the way along the Tian'-Shan' between the Musart and Zauka Passes also failed to confirm Humboldt's supposition about volcanic phenomena in Central Asia.

The *aul* in which I spent the night of 21–22 September was located by the wells of Kabandy, twenty-three *versts* north of the Western Ala-Kul'. It was 14°C at seven o'clock in the evening here, and a hypsometric measurement gave the altitude as 250 metres, that is no more than ten metres above the level of the Western Ala-kul', and that was confirmed by the fact that the track from Ala-kul' to the place of our overnight camp had hardly any gradient. But it seemed to me that the level of the Western Ala-kul' was higher than the level of the Eastern Ala-kul'. I concluded that from the fact that I encountered a river-bed, oriented from the northern extremity of the Western Ala-Kul' towards the lower reaches of the river Urdzhar. The Kirgiz called this river-bed the Ualy and claimed that when the water was high in the Western Ala-kul', water flowed along it into the river Urdzhar. Moreover, the rivers flowing into the Western Ala-kul' (the Tentek and Karakol) were hardly less full than those flowing into the Eastern Ala-kul' (the Urdzhar and Emil'), yet the latter lake presented a surface for evaporation which was three times larger than the Western Ala-kul'. Perhaps it was as a consequence of this that the water in the Western Ala-kul' was fresh and suitable for drinking, but in the Eastern Ala-kul' it was brackish, as a result of which the natives called the Eastern Ala-kul', Ashchi-kul', that is 'the bitter lake'.

I do not know whence Alexander Schrenk obtained the name of Sazyn-kul' for the Western Ala-kul', but those Kirgiz who were asked did not know this name and always called the Western Ala-kul', Ala-kul', and the Eastern one they called either Ashchi-kul', or also Ala-kul'. Who could be surprised by the fact that the

<sup>1</sup> Kucha (Kuch'e or Gutsy) was a district town, originally surrounded by a high mud-brick wall, on the river Kungei-kok-su in the Chinese province of Xinjiang. Its fertile environs were well cultivated, and in the immediate vicinity deposits of coal, copper, iron, sulphur, salt and ammonium chloride were exploited in the nineteenth century. Hides from this locality were supplied to the shoe-making industry at Ak-su.

two adjacent lakes, which made up one basin within living memory, and even now sometimes flowed together as one lake, were known by the same name. This whole basin could have derived the name Ala-kul' from the fact that from its surface there arose rocky porphyry islands and peninsulas as high *sopki*, while the isthmus, which divided the whole basin into two lakes, consisted of intermittent lagoons, channels which became overgrown with halophytes of *solontsy* and extensive reed thickets. If one was to look at all of this from any *sopka* (*aral-tiube*) by the lakeside or near the lake, the name of 'the Motley Lake' (Ala-kul') justified itself fully. The Kirgiz who accompanied me and who had never climbed Aral-tiube could not give an explanation, but to my question as to why they called the lake Ala-kul', the two most alert guides replied: 'Because the motley mountains (Ala-tau) could be seen from both sides of Ala-kul' ', that is the mountains which always had snow patches on them.

On 22 September I started from the place of our overnight camp at the Kabandy wells at about ten o'clock in the morning, and having travelled for about ten *versts* towards the north-west, reached the river Karakol, and from here I proceeded across the steppe towards the north-east, in two places encountering *auly* by wells, then having turned towards the north, forded the river Issyk-su and, through the old arable lands and *aryki*, by three o'clock in the afternoon I reached Urdzhar *stanitsa*,<sup>1</sup> which is situated only twelve *versts* away from the foot of the Tarbagatai. At seven o'clock in the evening I made my hypsometric measurement, which gave 280 metres for the altitude of the *stanitsa*; my thermometer showed 7°C.

In Urdzhar *stanitsa* during my visit in 1857 there were eighty houses and 940 inhabitants (536 males), 440 horses and 450 head of cattle. The inhabitants did not breed sheep, as it was possible to get as many as one needed from the Kirgiz-Kazakhs. The arable lands of Urdzhar settlers were extensive (100 *desiatiny* of rye, ten *desiatiny* of *iaritsa*, 120 *desiatiny* of wheat, 106 *desiatiny* of oats, fourteen *desiatiny* each of barley and millet, seventeen *desiatiny* of flax). Rye yielded five-fold, but the harvests of spring grains were excellent: wheat eight-fold, *iaritsa* and oats more than thirteen-fold. There was also a very good flax yield.

Having spent the night of 22–23 September in Urdzhar *stanitsa*, I decided to devote the whole of the next day to the ascent of the Tarbagatai. Having left the *stanitsa* at seven o'clock in the morning, at first I made for the west, and then to the west-north-west along the river Karabulak. Soon we came out at a spring, overgrown with poplars (*Populus laurifolia*) and shrubs: honeysuckle (*Lonicera tatarica*), buckthorn (*Rhamnus cathartica*) and dwarf acacia (*Robinia pygmaea*). The first outcrops encountered by us in the Tarbagatai consisted of granite. Then

<sup>1</sup> Urdzhar village in the *raion* of the same name in Semipalatinsk *oblast'*, lies 173 km to the south-east of the present Aiaguz railway station on the Semipalatinsk-Almaty line. In the later Soviet period it comprised two state farms, specializing in vegetables and grain, and three machine tractor stations.

there began a steep rise along a gorge, which passed along the line of contact between the granite to the north-east and the diorite to the south-west. The track went over piles of rocks and was very difficult. However, when we climbed the mountain crest, we then went by easy passes towards the west-north-west, and finally, having gone round a cliff, separated from the main axis of the ridge, we reached the top of the pass, which our guides called Alet, and which consisted of granite. We reached the crest a little before noon. My Celsius thermometer showed 4°. A hypsometric measurement gave 1,960 metres as the absolute height for the top of the pass. There were patches of perpetual snow lying on the adjacent heights.

When I climbed one of the summits of the Tarbagatai, an unusually extensive view unfolded before me. On the southern side there stretched the wide steppe, across which, twisting as on a map, the river Urdzhar was flowing towards the south, while further away hundreds of sparkles, alternating with dark spots, marked the location of the 'motley lake' (Ala-kul'), and beyond it, on the far horizon the snowy summits of the Semirechensk Alatau merged with the clouds.

On the other, northern side of the pass there stretched an even wider, but undulating, steppe, on which one could make out the meanderings of the river Bazar, flowing to the north, and further, in the foggy distance, the outlines of the vast basin of Lake Zaisan were barely visible.

Thus the mountain crest of the high Tarbagatai separated two wide steppe routes, across which from the second century BC and up to the thirteenth century those great migrations of peoples, which had such an enormous influence upon the fates of Europe, and especially Russia, over twelve centuries came down from upland Asia, as through a gate, into the extensive lowland of the Sikhai (Western Sea), that is into the Balkhash-Aral-Caspian basin.

The nomads coming through the Zaisan Gate naturally descended along the course of the Irtysh, across the Pri-Irtysh steppes, and then along the later Siberian-Irtysh sentry line, emerged on the river Ural and thus entered Europe through the broad gateway of the vast steppes separating the southern extremity of the Urals range from the Aral Sea.

The human migrations which passed through the Ala-kul' (Dzhungarian) Gate, came through them directly into the Balkhash lowland, but some, the less numerous of them, turned to the south-west through the Semirechensk territory, crossed the river Ili in its lower course, emerged at the river Chu, and from there to the river Jaxartes (Syr-dar'ia) and, having passed through the steppes of Turkestan and Turkmenia, went around the Aral and Caspian Seas from the southern side, and passed into Europe through the Caucasus isthmus. Yet others, more numerous masses, went around Lake Balkhash on the northern side and proceeded through the very heart of the Kirgiz steppes, thereby reaching the river Ural without obstruction, since the nomads who occupied these steppes not only did not stand in the way of their movement, but were also drawn into it, so

that the migrations of the nomads were like a snow avalanche falling from a mountain top, carrying along with it not only the snowy masses through which it passed, but also enormous rocky boulders.

But the nomadic hordes which passed through the Kirgiz steppes also invaded Europe through the same Caspian-Ural Gate, since the nomads with their numerous herds and flocks were compelled to go on the southern side around the extensive forests, which were widespread in the Urals and in the modern Ufa province, and which indeed presented an obstacle that was difficult to overcome for the movement of migrants with their herds.

Having spent more than an hour on the crest of the Tarbagatai, we quickly began to descend into the plain of Ala-kul' and returned only at midnight to Urdzhar *stanitsa*, where we spent the night.

On 24 September I left Urdzhar *stanitsa* at seven o'clock in the morning. I proceeded across the plain for about six *versts* as far as the river Urdzhar. Beyond it there began slow ascents to drawn-out elevations. Here and there along the way-side granite and diorite outcrops were visible. The vegetation consisted of steppe shrubs (*Spiraea* and *Amygdalus*) and steppe grasses, among which I noticed *Althaea*, *Eryngium campestre*, *Dipsacus*, *Salvia sylvestris*, and *Senecio*.

At last, after thirty-five *versts*, we came out to the river Terekty, the course of which was marked by a long line of poplars, and reached Terekty picket. From here, over a protracted slope, we came up to a mountain ridge, on which we constantly came across outcrops of granites and diorites, until we finally reached the main pass, Kotel'-asy. Its height, according to my hypsometric measurement, was 1,040 metres with the temperature at 14°C.

From here began the descent towards the river Karakol, by which was situated the Karakol picket, twenty-two *versts* away from the previous one. The river Karakol, flowing here between granite eminences, originated only twenty-five *versts* away. One *versta* from the picket there was a warm spring (Arasan), which was 9.8°C and was flowing from under a granite cliff. Leeches are found in the Arasan. The Kirgiz successfully treat rheumatism and other catarrhal illnesses here. The climate is much more severe here than in Urdzhar *stanitsa* and in Aiaguz. On 18 and 19 September there was a heavy fall of snow here, whereas it was raining in Urdzhar.

On 25 September, having spent the night at Karakol picket, I set out again at seven o'clock in the morning in very nasty weather, and, having passed through Verkhne-Naryn picket, by two o'clock in the afternoon reached Aiaguz, where I spent no more than two hours, and then set off in a very light carriage along the main Kopal post-road to Semipalatinsk, where I arrived early in the morning on 27 September.

As before, I stayed at the home of the hospitable Demchinskii, where I found in good working order my large *tarantas*, which had been left with him by my dear companion, the artist Kosharov, and which was filled with the treasures



gathered during my travels of 1857, my geological, botanical and ethnographical collections. That same day, as well as during the following days, I was visited by F. M. Dostoevskii, who was apparently in the best of spirits and imbued with a firm belief in his future. During the three days of my stay in Semipalatinsk I dined daily with the Governor (G. M. Panov), who informed me with pleasure that he was expecting official notification of a full amnesty for F. M. Dostoevskii.<sup>1</sup>

On 30 September I now left Semipalatinsk, having taken an emotional final leave of my three Semipalatinsk friends, and of General Panov for ever; about three years after my journey he died of the consumption, which had been destroying his constitution. I met the other two fairly soon, still alive, but under very changed circumstances for them. F. M. Dostoevskii, from whom I had taken with special pleasure his letters and instructions for his friends, I saw in Petersburg in the following year (1858), if not yet in prosperity, which he was never fated to enjoy in his life, nevertheless on the way to the peak of his glory as one of the greatest artists of the written word. As for Officer Demchinskii, who was brilliant in his own day and attractive by reason of his good nature and humanity, I met him a few years later in utter poverty and at the beginning of moral decline due to alcoholism, from which he was saved, however, by being appointed to a modest post as station-master of a small railway station on the Kozlovo-Voronezh railway.<sup>2</sup>

I arrived in hospitable Barnaul at the beginning of October, and as usual was welcomed very cordially by the highly cultured society of the 'Siberian Athens'. At that time, the attention of the whole town was consumed by rumours about the forthcoming emancipation of the peasants, and about what was happening in European Russia which would have a great influence on the future fate of Russia. One might think that this town, hidden aside from the main Siberian highway, in the wilds of Siberia where neither estates of the nobility nor landlord's serfdom had ever existed, was little affected by the reform being undertaken, but the cultured Russian society of Siberia could not remain indifferent to 'the distant noise of the struggle'.

However, as representatives of Barnaul society foresaw, the emancipation of the peasants from serfdom must have inevitable, and indeed very undesirable, consequences for them in the shape of the abolition of compulsory labour, not only by the miners, but also by the peasants of the Altai mining district. With regard to the miners, who were equated with the status of house-serfs on estates of the nobility, the Altai mining engineers did not express excessive fears. They thought it possible to replace compulsory with freely contracted labour in factories and mines, on condition that they would be given enough time for this

<sup>1</sup> Having had his civil rights restored on 17 April 1857, Dostoevskii was finally discharged from military service on 18 March 1859. While being given permission to return to Russia, he was not initially allowed to reside in the capital.

<sup>2</sup> The Kozlovo-Voronezh railway to Rostov was one of the most heavily used passenger and freight lines in the Russian network at the end of the nineteenth century.

reform, since landless miners, living in factory settlements and attached to them by semi-serfdom, would hardly be able to find any other profitable livelihood except that to which they had already been accustomed. But most of all the Altai administration feared rapid abolition of compulsory auxiliary labour from the rural population of Altai, since the smooth system of self-recompense for officials, which was built on these obligatory working conditions of mining peasants, was inevitably bound to collapse.

It goes without saying that I took a most active part in general debates about the consequences that emancipation of the peasants would have for Russia's future. From my conversations, it soon became clear that the unexpected news took Barnaul society unawares. It had only just got over the idea that the consequences of reform threatened it with great disadvantages, and hence the majority of Barnaul society regarded these reforms with fear and apprehension, but on the other hand a not insignificant minority regarded them with magnanimous, patriotic sympathy. With them I shared a profound conviction that the heroic Sevastopol war had clearly demonstrated the total bankruptcy of the entire state system of Russia, which could be rectified only by a series of judicious and vigorous reforms, that the emancipation of peasants from serfdom alone could be the first of such reforms, and that this emancipation could not take place without the allocation to the peasants of that land which they held.

In Barnaul I stayed in all three weeks, which was absolutely necessary for putting in order and packing my extensive collections, and then at the end of October I was already in Omsk.

In Omsk I did not find any changes. Omsk society did not even listen to 'the distant noise' of what was happening in Russia. The reforms being prepared there did not worry Omsk society, which was not directly affected by them. It did not yet grasp that emancipation of the peasants would inevitably entail a series of other reforms, which would change the whole structure of Russian provincial life. It did not occur either to the highest ranks of the Chief Administration of Western Siberia, or to the minor officials in Omsk's offices, that the opportunity for the former to receive additional payments from tax-farmers and the suppliers of provisions to troops located beyond the Siberian-Irtysh state border in Semirechensk territory, and for the latter the opportunity for engaging in bribery and corruption so openly and with impunity, would be terminated.

Only the young generation of officials with higher education, who had been attracted to Siberia mainly by the efforts of Governor-general Gasfort as officials of special commissions, and generally his closest collaborators, did not lose heart in their difficult struggle with the rapaciousness of the old system. Yet even they, being convinced, together with the Governor-general, of their impotence in this struggle, strove for transfers to European Russia. Even the youngest, most talented and pure-hearted, newly developing local activists, such as G. N. Potanin and Ch. Ch. Valikhanov, who were profoundly permeated by their aspirations

and thirst for knowledge, sought to complete their higher education at Petersburg University.

I found General Gasfort greatly aged and despondent since his journey to the coronation of Alexander II. There he had attracted little attention, and according to the opinion of one of 'the foreigners under his command' accompanying him, he, who appeared such a great man in the Kirgiz steppe, seemed quite small in the brilliant retinue of the Russian Tsar. In the capital cities no-one was bothered about the Trans-Ili territory, and no-one appreciated the services of General Gasfort, who had made it possible for Russia to acquire one of the pearls of Russian territory.

During his conversations with me and during my tales about the Trans-Ili territory and the Tian'-Shan', the old man completely came to life and, having freed himself from the 'megalomania', which made him ridiculous in the eyes of his associates, he quickly turned to the aspirations which were concealed in his heart. He saw that his concerns about the properly understood political interests and benefits of his adopted fatherland found a lively and competent appreciation in one of the modest representatives of Russian academic society. All the energy which he had displayed when occupying the Trans-Ili territory awoke again, and he began to question me as to what else, in my opinion, would have to be done for the Russian territory established by his efforts. I answered that in my opinion it was absolutely essential to give this territory stable and invulnerable borders, and for that it was necessary to naturalize the Bogintsy, and after them also the Sarybagish, who having found themselves in the same critical situation as the Bogintsy, between the hammer and the anvil, in no more than about two years would also be asking to become Russian subjects. Thus the Russian state border, having taken in the whole basin of Issyk-kul', would lean upon the snowy crest of the Tian'-Shan', while the key which should secure access to the Trans-Ili territory would now be easily found by occupying a fortified point in the Chu valley. From there, if the Russian government wanted to extend its state border in front of our extensive possessions in the Kirgiz steppes, it would be possible later to reconnoitre and draw a new border from the fortified point on the river Chu to Fort Perovskii and the river Syr-dar'ia.

General Gasfort listened attentively to the ideas which I expressed, and replied that in spite of the obstacles which naturalization of tribes, who were reckoned as being citizens of the Chinese Empire and Kokand khanate, would meet with on the part of the Ministry of Foreign Affairs, he would not hesitate to make representation on this subject to the Minister of War, but that for his part he hoped that the Geographical Society, among whose leaders there were many officers of the General Staff, would promote the familiarization of Petersburg government circles with the situation and needs of the periphery that had been entrusted to him.

Parting, this time for ever, with this worthy gentleman, who in any case had

rendered me indubitable services, and having thanked him on behalf of the Geographical Society for his assistance to my travels, I also petitioned him on two private matters.

Firstly, I asked him to send Lieutenant Chokan Valikhanov, dressed in his national costume, on a mission to Kashgar in order to gather detailed information about the death of Dr Adolf Schlagintweit, a matter of equal concern to both the Russian and Berlin Geographical Societies and to all the educated world in general, and also to try and collect everything that might have survived from his materials, diaries, etc., and then on Valikhanov's return to give him the opportunity, while still being in the Governor-general's service, to come to Petersburg for a prolonged period in order to write up the excellent ethnographic and historical materials about the Kirgiz steppe which he had already collected. Moreover, I had promised Valikhanov the broad patronage and assistance of the Geographical Society.

My second petition was for the release of *sotnik* Potanin from completing his compulsory years of military service, in order to give him a chance to secure higher education in Petersburg. Gasfort agreed to both my solicitations with pleasure, explaining to me that, always and everywhere, he would lend a helping hand to all the talented people whom he met.

In Omsk I stayed only three days and then hurried to Petersburg, where I rushed to be in time for the renewal of Russia for which I was ardently waiting.

I arrived in Petersburg by 15 November 1857.



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