the high plateau; (2) the alpine tracts—(a) the Altai and (*b*) East Sayan, with a sub-region to the east of Lake Baikal; (3) the steppe regions of Western Siberia; (4) the Ishim and Baraba plains of the same; (5) the high plains of Eastern Siberia, with the sub-region (6) of Minusinsk; (7) the Daurian flora of the lower terrace of the plateau in Transbaikalia; (8) the Amur; (9) the Usuri and Pacific littoral region; (10) the arctic tundras, which, as shown by the “Vega” expedition, may be subdivided into those (*a*) west of Yenisei and (*b*) east of the same to Behring Strait; and (11) Kamchatka. Each of these has distinct features; neverthe­less, if the basin of the Amur and Kamchatka be set aside, all have so much in common that the “Siberian flora” may be spoken of as a whole. Siberia is situated for the most part in the great domain which Grisebach describes as the “forest region of the Eastern continent.” @@1 The northern limit of this region must, however, be drawn nearer to the Arctic Ocean. Only a narrow strip, 60 to 200 miles wide (becoming broader in the Taimyr and Samoyede penin­sulas), is totally devoid of tree vegetation. The last trees, it is true, which struggle for existence on the edge of the tundras are crippled dwarfs and almost without branches; a few buds each summer are the only evidence that life has not left their frozen stems; and trees a hundred years old are only a few feet long and a few inches thick, concealed amidst lichens.@@2 Some 200 species of flowering plants are still found in the tundra region,—the frozen ground and the want of humus militating more against them than the want of warmth.@@3 From this northern limit to the Aral-Caspian and Mon­golian steppes we have all over Siberia the forest region, where, however, forests are very unequally distributed, covering from 50 to 99 per cent. of the areas of the separate districts. In the hill tracts and the marshy depression of the Ob they are unbroken, except by the bald summits of the loftier mountains (*goltsy*); they have the aspect of agreeable bosquets in the Baraba; and they are thinly scattered through the south-eastern corner of Transbaikalia, where the dryness of the Gobi steppe is so much felt; while immense marshy plains covered with the dwarf birch take their place in the north as the tundras are approached. Over this immense area the trees are for the most part the same as we are familiar with in Europe. The larch becomes predominant and presents itself in two new species (*Barix Sibirien* and *L. dahurica*)*.* The fir appears in the Siberian varieties *Picea obovata* and *P. ayanensis.* The silver fir (*Abies sibirica, Pinus Pichta*) and the stone-pine (*P. Cembra*) are quite common; they reach the higher summits, where the last-named becomes a recumbent species (*Cembra pumila*)*,* while the larch and the silver fir also acquire a tendency to spread their side branches instead of rising in height. The willow at high altitudes grows only two inches high, but still bears a few leaves and fully de­veloped flowers. The birch in the loftier alpine tracts and plateaus becomes a shrub (*Betula nana, B. fruticosa*)*,* or in Transbaikalia assumes a new and very elegant aspect with a dark bark (*B. dahu­riea*)*.* In the deeper valleys or on the lowlands of Western Siberia the larches, pines, and silver firs, mixed with birches and aspens, reach a great size, and the streams are fringed with thickets of poplar and willow. The alpine rose (*Rhododendron dahuricum*)flourishes in large masses on the higher mountains; *Juniper, Spirsea, Sorbus,* the pseudo-acacia (*Caragaηa sibirica* and *arbor*­*eseens, C. jubata* in some of the higher tracts), various *Rosaceæ— Potentilla fruticosa* and *Cotoneaster uniflora—*the cherry-plum (*Prunus Padus*)*,* and many other shrubs fill up the spaces between the trees. Berry-yielding plants are found everywhere, even on the *goltsy,* at the upper limit of tree vegetation; on the lower grounds they are an article of diet to the hunter, and even to the agriculturist. The red whortleberry (*Vaccinium Vitis idæa*)*,* the bog whortleberry (*V. uliginosum*)*,* the bilberry or cowberry (*V. Myrtillus*)*,* and the arctic bramble (*Rubus arcticus*) extend very far northwards; raspberries and red and black currants form a rich undergrowth in the forests, together with the *Ribes dikusha* in Eastern Siberia. The oak, the lime, the maple, disappear to the east of the Urals, to reappear, however, in new varieties on the eastern slope of the border-ridge of the great plateau (timidly pene­trating west for some little distance up the valleys of the Amur and the Argun).@@4 There we have the oak (*Q. mongolica*)*,* the maple (*Acer ginala,* Max.), the ash (*Fraxinus manchurica*)*,* the elm (*Ulmus montana),* the hazel (*Corylus heterophylla*)*,* and several other Euro­pean acquaintances. Farther east, in the Amur region, a great number of new species of European trees, and even new genera,

such as the cork-tree (*Phellodendron amurensis*)*,* the walnut (*Juglans manchurica*)*,* the acacia (*Maackia amurensis*)*,* the graceful climber *Maximowiczia amurensis,* the Japanese *Trochostigma,* and many others—all unknown to Siberia proper—make their appearance.

The greatest uniformity prevails on the high plateau, where the larch predominates over all other species of conifers or deciduous trees ; the wide and open valleys—or rather shallow depressions— are covered with *Betula nana* and *B. fruticosa* in the north and with thick grasses (poor in species) in its southern and drier parts. The same Siberian larch covers the alpine tracts fringing the plateau on the north; but the tree assumes different characters in develop­ment and growth according to the physical features of the region; and the fir, the stone-pine, the aspen, and the birch also become mixed with it; in the narrow sheltered valleys the forests attain their full development. In the drier parts, on the slopes covered with sand or with a richer soil, the Scotch fir (*Pinus sylvestris*) makes its appearance. In the alpine tracts of the north the narrowness of the valleys *{padi)* and the steep stony slopes covered with débris, on which only lichens and mosses can grow, make each green plot of grass (even if it be only of *Carex*) valuable to the gold-diggers and hunters. For days consecutively the horse of the explorer can get no other food than the dwarf birch. But even in these dis­tricts the botanist and geographer can easily distinguish between the *tcherñ* of the Altai and the *taiga* of different parts of Eastern Siberia. The lower plateau exhibits, of course, new characteristics. Its open spaces are lovely prairies, on which the Daurian flora appears in its full beauty. In spring the traveller crosses a sea of grass from which the flowers of the pæony, aconite, *Orobus, Carallia, Saussurea,* and the like rise to a height of 4 or 5 feet. As the Gobi desert is approached the forests disappear, the ground becomes chiefly covered with dry *Gramineæ,* and *Salsolaceæ* make their appearance on a gravelly clay impregnated with salt. The high plains of the west slope of the plateau are also covered with rich prairies diversified with woods. Nearly all the species of these prairies are common also to Europe (pæonies, hemerocallis, asters, pinks, gentians, violets, *Cypripedium, Aquilegia, Delphinium,* acon­ites, irises, and so on); but here the plants attain a much larger size,—so large indeed that a man standing erect is concealed by the grasses. The flora of Minusinsk—the Italy of Siberia—is well known; the prairies on the Ishim and of the Baraba (see Tomsk) are adorned with the same rich vegetation, so vividly described by Middendorff and Finsch. Farther north we again reach the domain of forests; but these once more present new characteristics. They are the *urmans* of Western Siberia, into which the hunter does not venture to penetrate far from his village,—immense tracts covered with thickets of trees closely packed and therefore poor in aspect, and often rising from a treacherous carpet of thickly woven grass which conceals deep marshes (*zybuny*)*,* where even the bear has to tread circumspectly. The prairies of the middle Amur and the rich plains of the Selimja and Zeya, where Russian Raskolniks are so successful as agriculturists, belong to Manchuria.

The fauna of Siberia is closely akin to that of central Europe; and the Ural Mountains, although the habitat of a few species which warrant the naturalist in regarding the south Urals as a separate region, are not so important a boundary zoologically as they are botanically. As in European Russia, so in Siberia, three great zones—the arctic, the boreal, and the middle—may be dis­tinguished; and these, according to M. Syevertsoff,@@5 may be sub­divided into several sub-regions. The arctic (hyperboreal) zone has the same characters as the tundra zones of European Russia. The boreal (circumboreal) zone, which corresponds to the forest region of Russia, embraces Western Siberia, with the exception of the Urals and the southern steppes, and a notable part of Eastern Siberia,—Transbaikalia and the hilly tracts to the north of it being distinguished as a separate “Eastern Siberian” sub-region. The middle zone, extending from south Russia to south Siberia, has two separate sub-regions,—the Ural-Baraba and the Daurian. The zone of the steppes extends from the Caspian Sea through Central Asia, only touching Western Siberia and the neighbourhood of the Gobi in Transbaikalia. Finally, the Amur region shares the character­istics of the north Chinese fauna. On the whole, we may say that the arctic and boreal faunas of Europe extend over Siberia, with a few additional species in the Ural and Baraba region,-—a number of new species also appearing in Eastern Siberia, some spreading along the high plateau and others along the lower plateau from the steppes of the Gobi. The arctic fauna is very poor. According to Nordqvist,@@6 it numbers but twenty-nine species of mammals, of which seven are marine and only seventeen or eighteen may be safely considered as living beyond the forest limit. Of these, again, four are characteristic of the land of the Tchuktchis. The wild reindeer, the arctic dog (*Canis lagopus*)*,* the fox, the hare, the wolf, the lemming (*Myodes obensis*)*,* the collar-lemming (*Cuniculus tor­quatus*)*,* and two species of voles (*Arvicolae*) are the most common on land. The avifauna is very rich in migratory water and marsh

@@@1 According to Engler’s *Versuch einer Entwickelungsgeschichte der Pflanzen­welt* (1879), we should have in Siberia—(*a*) the arctic region; (*b*) the sub-arctic or conifer region,—north Siberian province; (*c*) the Central-Asian domain,— Altai and Daurian hilly regions; and (*d*) the east Chinese, intruding into the basin of the Amur.

@@@2 Middendorff's observations on vegetable and animal life on the borders of and in the tundras—so attractively told in vol. iv. of his *Sibirische Reise—*will long remain classical.

@@@3 M. Kjellmann (*Vega Exp. Vet. Iakttagelser*) reckons their number at 182; 124 species were found by Middendorff on the Taimyr peninsula, 219 along the borders of the forest region of Olenek, and 344 species within the forest region of the same; 470 species were collected by M. Maack in the Vilui region.

@@@4 Nowhere, perhaps, is the change better seen than on crossing the Great Khingan. The change in the flora witnessed by the present writer on his way from Transbaikalia to Mergeñ was really astonishing.

@@@5 “Horizontal Distribution of Animals,” in the Bulletin (*lzvestia*) of the Society of Friends of Natural Science, vol. viii., 1873.

@@@6 “Anteckningar och Studier,” &c., in *Vega Exp. Vet. Iakt.,* vol. ii.