Journeys in Sweden
Linnaeus leans over the railing and follows car after car that disappears beneath his feet. You are standing on a viaduct that crosses a busy motorway. “There’s certainly faster means of transport available in your time” he shouts against the noise of two lorries that are thundering past. Then he starts to tell you what it was like to travel in Sweden in the 18th century. He himself undertook a number of adventurous journeys to various provinces. “I remember so well the beautiful morning I rode out of Uppsala at 11 o’clock to start my journey to Lapland. I was full of expectation and the joy of discovery,” he says.

With him on his horse’s back he had a leather bag that he had carefully packed with one shirt, two short-sleeved jackets, two nightshirts, a woollen cap, a comb, inkhorn, penholder, magnifying glass, telescope, gauze hood against the mosquitoes, scientific books, a diary to keep notes on the journey in and sheets of paper to place the plants he collected in. Between his thigh and the saddle he had placed a small pistol. He was dressed in a wig, coat, leather trousers and riding boots. In his pocket he had his wallet with his travel passes and a letter of recommendation. He also took with him a small rapier and an octagonal stick, a kind of almanac, which would help him to keep track of the days. That was his baggage for the five-month-long journey. It was at times to be a dangerous adventure for the 25-year-old Linnaeus.

You look questioningly at Linnaeus. “Travel passes?” “Yes, you had to have them to prove your identity and show that you were travelling on honest business,” he replies. Travel passes were issued by County Governors or by priests. One important rea-
son for requiring travel passes was to stop vagrancy. You had to show your pass, for example when you passed a town’s tollgates, travelled by ferry or arrived at an inn. Linnaeus turns reluctantly away from the cars that seem to be unceasingly swallowed up by the viaduct’s concrete maw below. He takes a seat for a moment, his eyes scowling at the passing motorway traffic below. He looks quickly at you, commenting that Swedish roads in the 18th century were often in bad shape. In rainy weather there were often impassable. There were cobbled roads only in the towns and their approaches and in large villages. Some roads and bridges were badly damaged by the army’s heavy cannons.

When Linnaeus was on his journey to Lapland, there was often no road network at all. The interior of Norrland was in principle one great wilderness that required boats at times, or strong legs. He was obliged to wade through trackless bogs and put up with being hungry and eating fish full of worms, and feeling cold and exhausted. “There were times when I really regretted letting myself in for that journey,” he says, his eyes fascinated again by the passing motorway traffic below.

You yourself stand with your back against the railing, wondering how you would have felt about such an expedition. “It must have felt considerably safer travelling along the roads,” you say. Linnaeus nods and explains that there was a system of inns along the main roads in Sweden. These inns offered not only food and accommodation, but also a place where you could change horses. You could even order a carriage if you wanted to travel more comfortably. “Comfortably—that’s a dubious word”, says Linnaeus. He explains that the so-called comfort should be seen in the light of the road standard, in combination with the springless carriages that had wooden wheels shod with iron. The last journey that Linnaeus undertook, to Skåne, was by horse and carriage.

The inns were scattered along the roads at an average distance of about 20 kilometres. The county maps of those times clearly give the distances between the inns. But maps like that were not available for the general public and travellers until the mid-18th century, when the strategic military secrecy surrounding them was relaxed. Until then, travellers had to make do with the distances shown on the milestones along the roads.

Suddenly Linnaeus leaves his place by the viaduct railing, swings round and starts digging in his bag. He soon pulls out a yellowed sheet of paper, which he waves at you. “Look at this!” he says. “A very useful book.” You read the elegant text on the title page:

*A Wayfarer’s Guide to and from All Towns and Known Places in the Kingdom of the Sveas and the Goths and the Grand Duchy of Finland.* It was first printed in 1743 and was the first and only Swedish guidebook of its time. You turn the pages carefully and see that it contains information about the distances between various Swedish towns, given in miles and half-miles and even quarter-miles. In the 18th century a mile corresponded to 10,688 metres. In the margins are printed notes about the various places with information about inns, ferries and attractions. At the back of the book there is an even a road map of Sweden. The Guide ran into several editions and was used a lot by government officials on their travels.

Linnaeus puts the guide back in his bag and starts explaining the reason for his journeys. 18th-century society was characterised by a strongly utilitarian way of thinking, and science was at the service of the state. Research was expected to contribute to the economic development of the country. The parliament of that time thought that the dependence on imports should be reduced and the country’s economy improved by better using the domestic sources of, for example, medicinal and dye plants, flint and gypsum. “So my task on my journeys was to investigate the natural resources of the country and its industries.”

His commission as the state’s representative was, however, coloured by his vocation as a scientist. That is why, in his notes from the journey to Skåne, for example, we find observations on everything from molehills to changes in the level of the sea, combined with notes on natural resources and industrial possibilities. Thanks to Linnaeus’s broad curiosity and sharp observational powers, his travel diaries have also given the world invaluable insights into the everyday working life and living conditions of ordinary people.

“Your texts really have a remarkable ability to capture details and cover both the narrow and the broad view,” you say, with a note of admiration in your voice. Linnaeus makes a deprecating gesture. “The ability to observe, describe and draw conclusions is as self-evident to me as it is necessary,” he replies.

Suddenly, you realise that the noise from the motorway is very intrusive and tiring, although it does
not seem to have disturbed you much before in your conversation. "If you’ve seen enough of cars, we might walk away from the motorway,” you suggest. Linnaeus nods, commenting that the 21st century has its disadvantages as well. While you stroll along the cycle track, you discuss the value of different kinds of natural resources. You tell him that the term natural resources has been given an exciting new dimension in modern times. “Did you know, for instance, that the Falun copper mine is a great tourist attraction and has also been nominated as a world heritage site by UNESCO?” you ask. Linnaeus looks at me in surprise. He remembers his visit to the copper mine during his journey to Dalarna in 1734. He can never forget the miners’ toil under extremely dangerous working conditions.

You explain that natural resources are no longer valuable just as industrial raw materials but also for giving people enjoyable experiences. Recreation, outdoor life and tourism are concepts that are increasingly important. People seek experiences that nourish their souls, from quiet relaxation to challenging adventures. “By the way, perhaps you’d like to meet a present-day explorer who is motivated by the desire to communicate Nature experiences. He’s a man with a great interest in Nature,” you add. Linnaeus raises his eyebrows. “A modern explorer? Are there any today, now that your world seems to have been so completely explored?” he wonders.

You smile a little secretively and suggest that you should sit down by the roadside. You take out your laptop with its web-camera and quickly get onto the Internet. The nature photographer and film-maker Mattias Klum appears on the screen. Klum waves cheerfully, which makes Linnaeus automatically do the same. You explain that Mattias Klum is famous for his unique pictures of animals and plants from a series of expeditions in exotic natural environments. He has, for example, done work on several occasions for the National Geographic magazine. Klum is used to being called a modern explorer.

“Then you lie full length on the grass and look up at the clouds. And play guessing games about them,” Klum continues. “And it’s a matter of enjoyment, too,” he adds. He says that the joy of discovery comes from mankind’s curiosity, a quality that all children have but adults often lose. So the aim of his photography and filming is to arouse people’s curiosity, to get the public to wonder at all the exciting things there are in natural environments. In the long run, his aim is to inspire people to protect Nature and to care about more sustainable development in society. But if they are to commit themselves, they must first be moved emotionally.

Klum likes to talk about the need for sustainable development. He thinks it is important that every individual realises the value of finding his or her role in this work. “But you have to awaken interest with the help of joy and playfulness, for both children and adults,” he says. “I want to work on the basis of possibilities, not problems. There should be a serious note, too, but you have to inspire people to feel that they can actually play a part, and get both pleasure and influence.” Using experiences is a good teaching approach, he believes, and points out that everybody can in fact do their own explorations and expeditions. “It needn’t be more than going out on a picnic,” he says. “And you can think of the learning of knowledge as a journey of exploration in itself.”

Then Klum leans forward so that his face fills the screen. He gives a big smile and says: “Have to go now, but I’d like to say, Mr Linnaeus, that you are brilliant. And another thing, don’t forget that the world is still full of discoveries!” A quick goodbye, two clicks of the mouse and you put the computer away in your bag. Then you lie full length on the grass and look up at the playful clouds above. Linnaeus is not slow to follow your example. After a couple of minutes of thoughtful silence, you both comment contentedly that the whole of life can actually be looked upon as one single voyage of discovery. “There’s an explorer inside every person,” you say. “Mmm, and there’s really always something more to investigate,” Linnaeus replies. Then you devote yourselves to working out heavenly figures among the clouds. And play guessing games about them.

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“You have to remember that there are many ways of exploring,” Klum says via the computer screen. “You can travel on a small and a large scale.” He points out that, despite his adventurous journeys abroad, he can actually get just as much of the joy of discovery from visiting the little squirrel wood at home where he lives in the Lake Mälaren valley. For example, looking at the delicate and endlessly beautiful blue anemones that poke their heads up among last year’s dry oak leaves is a great experience, as well as being a reminder of the annual rhythm of life. Linnaeus enthusiastically when he hears Klum’s thoughts.

“For me, the joy of discovery is about meetings; every time I lift a leaf, every time I bring up a fishing net in a lake,” Klum continues. “And it’s a matter of enjoyment, too,” he adds. He says that the joy of discovery comes from mankind’s curiosity, a quality that all children have but adults often lose. So the aim of his photography and filming is to arouse people’s curiosity, to get the public to wonder at all the exciting things there are in natural environments. In the long run, his aim is to inspire people to protect Nature and to care about more sustainable development in society. But if they are to commit themselves, they must first be moved emotionally.

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Why did Linnaeus Travel?

“Here you can see how much at home in Sweden is unknown – and much more, too; see how each province has its advantages; see how they can be improved; see what incredible benefits Sweden would have if all these provinces were explored; see how one province can help the others in their work.”

From the introduction to The Journey to Dalarna. The illustration, which Linnaeus himself drew, is of a Sami (Laplander) carrying a boat. (From The Journey to Lapland)

Carl Linnaeus travelled considerably more in Sweden than abroad. His only journey abroad started in 1735 with the aim of getting a medical doctor's degree in Holland, a degree that could not be taken in Sweden at that time. This degree was considered important for Linnaeus's chances of supporting himself. He would then be able to marry Sara Elisabeth Moraea, whom he had got to know and fallen in love with during a visit to Falun at Christmas, 1734. Linnaeus did not return to Sweden until 1738, after having visited England and France as well. This journey meant that Linnaeus was able to make valuable contacts with influential scientists and other important persons in Holland, England and France – contacts that he kept up in many cases after he returned to Sweden. Linnaeus did not make any other journeys abroad, but he did undertake five extensive journeys to different parts of Sweden.

Linnaeus thought that science could contribute to an improvement of Sweden's economy after the disastrous wars in the 17th and early 18th centuries. The journeys to the provinces played an important part, therefore, in taking stock of natural resources and useful methods in various parts of the country and thereafter spreading the information and good ideas. Linnaeus wanted Sweden to grow and manufacture as much as possible inside the country. This included, for example, tea bushes, certain medicinal plants and mulberry trees for silkworms. Linnaeus noted down everything he saw, great and small, in lively language that gives us a good picture of Nature and people's lives in the 18th century.

Linnaeus's first journey was to Lapland and was made on his own initiative with the aim of exploring what was in many respects an unknown part of Sweden. This journey was financed by the Royal Swedish Academy of Sciences and was of great importance for Linnaeus’s future career. The next journey, to Dalarna, was commissioned by the County Governor, who wanted him to take stock of and describe the natural resources in that province in the same way as he had done in Lapland. The other journeys to Öland-Gotland, Västergötland and Skåne were commissioned by the Swedish Parliament. See map over Linnaeus's travels on the back side of the cover.

These five journeys are described in the following short texts that focus on one central theme for each journey: the life of the Samis (Journey to Lapland), Linnaeus's third kingdom, of minerals, with the Falun copper mine as an example (Journey to Dalarna), the special type of countryside found on limestone (Journey to Öland and Gotland), textile industry and dyeing methods (Journey to Västergötland) and finally agriculture (Journey to Skåne).

From the travel descriptions...

Linnaeus nearly killed himself climbing up Skule Mountain in Ångermanland on 20 May, 1732 on his journey to Lapland. Read his description of this event in the diary of this journey.

Linnaeus was attacked by angry farmers on 7 June 1741 on Öland. They thought he and his company were spies. Read about this event in the diary of the journey to Öland.

Linnaeus nearly lost all his money on Friday 7 June, 1749 on his journey to Skåne. The reason was that he wanted to prove that it was only superstition to believe in water-divining with a divining rod. Read about this event in the diary of the journey to Skåne.
On 12 May 1732, Carl Linnaeus set out on his first scientific expedition, a five-month-long journey to Lapland. He travelled northward along the coast and made three diversions into the interior. The furthest point north that he reached was the village of Vittangi, about 25 kilometres east of Kiruna. The return journey went via the Finnish coast and was completed by boat back to Sweden.

He reached the mountains in early July and was fascinated by them, as he was by the Sami, at that time called Lapps, and by the plants and animals there. He describes mountain lemmings, arctic foxes and ptarmigans and how the big predators, the wolves, bears and wolverines, made life difficult for the people. The wolves killed reindeer, while the bears and wolverines went into storehouses and stole food.

Most of all, he describes how the Sami lived and how important reindeer were for them. They formed the basis of the Sami’s lives and were essential for their livelihood in the harsh climate. They were also used as draught animals for transporting various kinds of goods, their milk could be drunk and used to make cheese, their hides were needed as bed clothing in their wigwam-like cots and to make shoes and clothes; the sinews were used to make thread to sew with, the bones were used to make handicraft, and the meat, offal and blood were used as food. Linnaeus was very interested in reindeer farming and describes how lassoes were used to catch the reindeer. He describes how the reindeer were milked, noticed that their ears were marked and that the Sami had different names for them according to their age.

He also describes the interiors of their cots, where reindeer skins were laid out to sit and lie on; in the middle was an open fireplace surrounded by stones. Linnaeus thought that the Sami led a good life in the summer: “I never saw any people have such good days as the Lapps.” They had clean fresh water and plenty of food. From the reindeer they got meat and milk, wild berries and plants
like common sorrel and angelica were part of their diet, char and whitefish were caught in the mountain lakes and were eaten fresh or smoked.

Nowadays, the question of the origin of the Sami occupies researchers of various kinds. Archaeologists, geneticists and linguists contribute to our knowledge of how they might have immigrated to the northernmost parts of Sweden. The possible routes, after the inland ice had melted in Scandinavia, were from the north and the east via Siberia and Finland and from the west along the ice-free Norwegian west coast. Despite a harsh climate there were enough resources for the first humans to live as hunters, fishers and gatherers. The oldest known settlement is 9,800 years old and is near Arjeplog.

How various sections of the population migrated can be mapped by studying the distribution of characteristic genes. Both DNA from mitochondrions, the cells’ power houses, and DNA from Y-chromosomes are used. Inheritance on the female side can be studied with mitochondrial DNA, since mitochondria are found in egg cells, whereas mitochondria are not usually transferred with sperms at conception. DNA from Y-chromosomes shows how genes are transmitted on the male side.

Today, about 60,000 Sami live in Norway, Sweden, Finland and the Kola Peninsula. Both DNA studies and archaeological finds support the hypothesis that the ancestors of today’s Sami migrated from both west and east, whereas the Sami languages, which are most closely related to Finnish, Karelian and Estonian, show influences from the east. One reason why the Sami population differs so evidently genetically may be that only a small number of individuals survived difficult periods of time (so-called bottle-necks). A limited selection of genes has therefore been transmitted to future generations.

Susanna Vaikapää, whose family are reindeer farmers, describes their conditions today:
About 2,500 Sami are reindeer farmers in Sweden today, a livelihood that has survived although areas for grazing are smaller because of forest clearance, and the extension of hydro-electric power stations. In traditional reindeer farming, the people moved with their reindeer, skis were used in the winter and in the summer they went on foot. Nowadays, the work has been modernised so that the reindeer are driven with snow-mobiles, cross-country vehicles and helicopters.

Linnaeus brought back from his Lapland journey a Lapp costume. He was very fond of this costume and used it, for example, when he proposed to his future wife, Sara Elisabeth (Lisa) Moraea. The costume was also a great hit when Linnaeus was in Holland.
Linnaeus is probably best known for his knowledge of plants, but he was also very interested in minerals and fossils. The mineral kingdom was one of the three kingdoms that Linnaeus divided Nature into. The other two were the plant and animal kingdoms. As early as 1733, he started a private course in the analysis of rocks and minerals, and even wrote a short textbook on the subject. The same year he was invited by a fellow student, Claes Sohberg, to celebrate Christmas in Falun, which in Linnaeus’s time was the fourth largest town in Sweden after Stockholm, Karlskrona and Göteborg. Solberg’s father was a mine inspector at Falun Mine, so Linnaeus had an opportunity to study the mineral kingdom more closely.

During the summer of 1734, Linnaeus was commissioned by the County Governor of Dalarna to undertake a scientific expedition through Dalarna together with seven other young men, in order to take stock of and describe the province. This expedition was particularly well organised, with each of the participants being given his own area of responsibility. The journal gives a good idea of what it was like to live in Dalarna in the 18th century and includes descriptions of food, clothing, and architecture; but it also dealt with the plants, animals and minerals that the group saw as they travelled.

The journey to Dalarna ends with a description of Falun Mine, which Linnaeus calls “Sweden’s greatest wonder”, at the same time as he describes it as a hell for the mine workers.

Copper ore has probably been mined in Falun Mine for more than 1,000 years. In the 17th century it was the largest copper mine in Europe. The ore has a high sulphur content and, apart from copper, contains other metals like gold, silver, zinc and lead. The mine shaft has a maximum depth of 600 metres and the galleries underground have a total length of 80 kilometres. The 17th century was the most important period in the mine’s history as it was vital for Sweden’s economy and its war-waging in Europe, where it was a great power. The copper was used to manufacture cannons, coins and roofing material, among other things. The importance of the mine began to decrease already in the 18th century, but mining did not cease entirely until the 1970s.

Today we can step into a comfortable lift and quickly descend to the old galleries. There we can try to imagine the miners’ conditions in Linnaeus’s time: how they climbed down fearfully long ladders or were lowered, balancing on a barrel, down into dark galleries that were lit only by flaming torches. Down there, several hundred
metres under the earth, they worked by hand to mine the valuable copper ore, naked to the waist because of the heat and with a woollen mask over their mouths to avoid breathing in the unhealthy smoke. The ore was mined by fire-setting, which means that great fires were lit in the evenings along the mine walls. These fires burned overnight and when the rock cooled, it cracked and pieces of the ore could be broken loose. Women and boys under 14 were not allowed to work down the mine. The average length of life of a mineworker was about 50 years, and the many miners’ widows only received a small pension from the mining company but they could make a living by selling beer and schnapps, for example.

In 2001, the mine, the town of Falun and the surrounding district were listed as a world heritage site because “The historical, industrial landscape round Stora Kopparberget and Falun comprise one of the foremost areas for mining and metal production. Mining operations ceased at the end of the 20th century, but for many centuries they had a strong influence on technical, social and political developments in Sweden and Europe.”

Students from schools in Dalarna can visit the mine and experience what it was like to work down there. Erik Arrhén is a world heritage teacher at Falun Museum:

**What would you like the students who come here to experience?**

“It certainly is exciting to read about the mine, but it’s something quite different to experience it yourself. With a sledgehammer in their hand, the students get a feeling for work in the old days and how it differs from today. They try out different kinds of jobs like fire-setting and winning ore, binding torches and carrying ore. They also get to work on various technical and mathematical problems you faced in mining.”

**Why is it important for students to have an understanding of their own history?**

“It might be easier to understand events in other places if you can connect them to what has happened in your own history. In our district there is so much concrete evidence of our history, as well. Old buildings, roads, ruins, graves and so on can be used to illustrate history.”
In the summer of 1741, Linnaeus was commissioned to travel to Öland and Gotland to take stock of and report on dye plants, deposits of china clay, medicinal plants and everything of value in the mineral, plant and animal kingdoms. Here he met a very different environment and plant life that fascinated him.

Even today, the countryside in southern Öland looks more or less as it did in Linnaeus’s time. This island, about 140 km long and at most about 15 km wide, is characterised in the south by the Alvar, an environment where the soil is so shallow that the limestone often crops out. The Alvar is flat, bleak, with a special flora that has southerly, easterly and northerly features, and contains a few plant species that are found only here in the whole world. This flora is adapted to the limestone bedrock and to a climate of boiling sunshine and drought in the autumn and snow and piercingly cold winds in the winter. In the spring and early summer there are many different kinds of orchids here. During the spring and autumn many birds rest on the southernmost headland on Öland, Ölands södra udde, on their way to and from the most northerly parts of Europe. Many birds are ringed every year and when they are caught again, they tell of long journeys to Africa and India, for example.

Linnaeus studied the limestone bedrock carefully and found fossils of various kinds of animals. “Where the rock had split lay “darts” or “Öland nails” as close together as grain in wholemeal bread; only God knows where so many rare shells came from. One kind of fossil, uncommon in other places but general here, resembles a *valvulam Echini*, often as big as the palm of your hand, looking like a half-moon with two parallel furrows and a number of crossing stripes.” Linnaeus realised that these relics came from water organisms and he searched the beaches for living animals with the same type of shell as the “Öland nails”, but found none.

What was it that Linnaeus observed? “Öland nails” and fossils with two parallel furrows, what might they be, and why did he not find any living animals of the same kind?
Linnaeus’s most active period was about 100 years before Charles Darwin in 1859 published “On the Origin of Species”, but Linnaeus had already had thoughts about the relationship between different organisms. In 1759, in his thesis “On Bisexual Reproduction”, he wrote that there was perhaps not such a great difference between plants and animals. “When we look at Nature’s connected chain of living beings, from the largest animals down to insects and worms, and then at the plant kingdom, the boundaries can hardly be distinguished. Nature moves forward in small steps, never in leaps.”

He also thought that the surface of the earth could change and that where there was now land there might earlier have been sea, an idea he based on observations of fossils of sea organisms that are now found on land. But he believed that all species had been created by God and that they could undergo only minor changes. During the 18th century, knowledge of the geological history of the earth grew, along with an understanding that the living organisms had developed into new forms by a natural selection of those best adapted.

The cultivated landscape of southern Öland has an old and well-preserved cultural landscape and a unique nature, so in 2001 it was added to the list of world heritage sites. At the Ecological Research Station of Uppsala University, which is located in southern Öland, a number of researchers are studying the plants and animals on the Alvar, and the ecological contexts in which they live, but they also want to interest children and young people in the fascinating countryside of the Alvar.

We ask Eje Rosén, one of the researchers and guides at the Research Station: Why is it important for children and young people to discover and experience nature?

“Children have to be allowed to discover, experience, feel and get to understand nature, its organisms and ecological or cultural connections, and to enjoy its beauty and be attracted by all its remarkable things, in the spirit of Linnaeus. Öland is a very good place for this, with all its interesting forest, beach and Alvar environments and its well-preserved historical buildings.

The future lies in our children – our future teachers, researchers, nature conservationists, politicians and the like. They are the guarantee that our biological diversity will be preserved – as well as our health and survival. Children have to be allowed to take part in all this, and feel that they are taking part. We older people have to give them that chance!”

"The character and qualities of the Alvar could now be seen; it forms most of all Öland, consisting of a horizontal height which is quite dry and bare and harsh, for it is only red limestone covered with a finger’s depth of soil or none at all.”

Rälla, 2 July 1741
In 1746 Linnaeus travelled to Västergötland and first visited the mountains there: Kinnekulle, Billingen and Mösseberg and nearby places. After that, he continued southwards to Borås and on to Alingsås and Göteborg. His journey then took him northwards to Bohuslän. The return journey to Uppsala went via Dalsland and Värmland.

It was a wet summer and he describes vividly a storm that swept across the Västgöta plain: “The weather on the plain was more violent, a strong headwind met us and soon it felt as though our eyes would be blown out of our heads. We were also drenched to the skin by the storm’s heavy showers.”

In the end, Linnaeus reached first Borås and then Alingsås, two towns that were known for textile handicraft in the 18th century. In his diary you can read that the women of Borås spun, wove and knitted more than anywhere else in Sweden. The Swedish textile and clothes design industry is still important in west Sweden.

Linnaeus thought that young men who were thinking of going on study trips to other countries should first see Falun and Alingsås. Falun had the economically vital Falun copper mine and Alingsås had a very lively textile industry at that time, with modern machinery and opportunities to learn about the latest methods for manufacturing textiles from skilled workers from Holland and France.

The textile industry in Alingsås was started by Jonas Alström, whose three sons studied under Linnaeus at Uppsala. His son Claes Alström travelled to Spain to collect and describe plants. Jonas Alström and Linnaeus were two of the gentlemen who founded the Royal Swedish Academy of Sciences, of which Linnaeus was the first Chairman.

Linnaeus’s diary describes how wool, cotton, camel hair, hemp, cow hair, flax, beaver hair and silk were used in the mills in Alingsås to make cloth, ribbon and stockings of all kinds. Just to prepare wool and make woollen cloth requires many different operations: wool has to be sorted, cleaned, combed and spun into thin threads. Then the yarn has to be dyed and the cloth woven, pressed and napped.

The dye-works in Borås and Alingsås imported many dyes, but Linnaeus considered that dye-plants should be cultivated to a greater extent in Sweden instead of being bought at high prices from abroad. Some of the dye-plants needed were grown outside Alingsås: madder (Rubia tinctorum) gave red pigment, weld (Reseda luteola) yellow pigment and woad (Isatis tinctoria) blue pigment. Other pigments like cochineal, from a kind of insect that gives red pigment, were purchased from abroad. Metal salts like tin and iron salts were used to process the pigments, giving several shades of colour. In addition, chemicals like alum (potassium aluminium sulphate) and wine-stone (potassium hydrogen tartrate) were needed to fix the pigment in the yarn.

Part of Linnaeus’s commission during his journeys in Sweden was to take stock of dye-plants and dyeing methods. Many different plants provide yellowish pigments; Linnaeus names sawwort, birch leaves and apple and alder bark. Skull lichen provides brown pigment, and twigs of alpine bearberry (Arctostaphylos) together with green vitriol (iron sulphate) gives black pigment. Linnaeus also describes how lichen was gathered from the cliffs on the west coast. It was dried and ground, after which urine was poured over it and it was left to stand for 4-5 weeks. A very strong purple pigment was obtained that was sold all over Sweden in Linnaeus’s time for dyeing yarn.

At a course at Gunnebo Hall outside Göteborg, teachers can practise dyeing yarn as in Linnaeus’s time. The Hall was built in the 18th century and they are now working on the buildings and gardens round the Hall to give them an 18th-century design. In connection with Linnaeus’s commission to take stock of dye-plants and dyeing methods, plants like golden rod, safflower and woad are being grown there. On the course, teachers try out various plants and ways of dyeing and can take away samples of yarn dyed with natural pigments to provide inspiration for projects with their own students.
Wool yarn fixed with alum and dyed with birch leaves, followed by treatment with green vitriol.

Unfixed wool yarn dyed with skull lichen.

Unfixed wool yarn dyed with rock tripe lichen and soaked in ammonia for two weeks.

Wool yarn fixed with alum and dyed with golden rod, followed by treatment with potash.
Linnaeus's last provincial journey was to Skåne, and this time he travelled in comfort by horse and carriage. His commission from Parliament was, among other tasks, to take stock of the deposits of gypsum (for decorations), flintstone (for tinder boxes) and walnut trees (for rifle butts). These products were imported at high cost.

Skåne has a varied landscape when the most fertile farming districts, then as now, are in the south and southwest. Linnaeus's diary describes a rich agricultural landscape full of farms and estates. Before land reform, the farms were gathered together in villages. The Great Land Reform came eight years after Linnaeus's journey to Skåne and the work of gathering every farm's land into one cultivated unit began thereafter.

The proportion of arable land on the Skåne plains was considerably greater than that of pastureland, compared with other parts of Sweden. This meant that there was a shortage of winter fodder for the cattle. Linnaeus noted that the horses had difficulty in pulling the ploughs after having eaten meagre fodder consisting mainly of straw during the winter. The three-field system, which Linnaeus describes below, meant that the first year rye was sown in the late summer and then harvested the following autumn. The next spring either rye or barley was sown, which was harvested the same autumn. The third year the field was left fallow and used as pasture. The sequence was then repeated.

In Linnaeus's time it was common for storks to build their nests on the farms. The top of a large tree was cut off and put up with a cartwheel as a foundation for the big nest built of twigs. In an entry dated 6 June, Linnaeus describes how one of the storks stood on guard at the nest with the newly-hatched chicks while the sparrows, which had also built their nests in the big stork's nest, chattered away. "the stork magnanimously pretended not to notice while they performed a continuous concert for him and his chicks."

The settlements on the Skåne plains today are covered by broad fields, where mainly corn or hay are grown. The wetlands have been drained; natural streams and winding, hand-dug, open ditches have been replaced by covered drains buried in the fields and deep, straight ditches where the water runs fast. The nutrients leached from the fields are quickly transported away to end up in shallow creeks, resulting in eutrophication and algal growth.

The last pair of storks nested in Skåne in 1954. Storks live mainly on frogs caught in wetlands and as the wetlands have been drained, it has become less and less possible for them to find food. At Vombs Meadows, east of Lund, attempts have been made to recreate wetlands that have been drained. The river that runs through the meadows has been restored to its original winding course and neighbouring land is flooded in the spring. The nutrients in the water are taken up by the vegetation, so fewer nutrients are carried away by the water.

When the area of wetlands increases, conditions improve for the return of the storks. Since 1979, storks have been raised in enclosures and there are now some 30 nesting pairs at various places in Skåne.

"The farms stand in large villages, where streams separate the land, which can be seen from far away through the trees planted on the farms, especially ash and willow, which both decorate and moisten the farms in the summer; but outside the farms there are no signs of trees. The farms use a three-field system, with winter rye, a little spring rye and barley, while the third part rests and is used as pasture. The marshy and low-lying land is meadow, but not large in proportion to the fields. This plain runs from north to south, as far as the eye can see; enclosed on the east by the sea and on the west by high, forested land like a great ridge."

From the Journey to Skåne (southeast Skåne) 26 May
It is difficult to imagine what the agricultural landscape looked like before artificial fertilisers and covered drains were introduced, but at Hörjel Farm, a nature school in Skåne, they are trying to recreate the old landscape. Teachers and school classes visit the farm to try out old farming methods and list plants and animals.

Lena Lundqvist, a biology teacher from Malmö, visits Hörjel Farm every year with her classes. What do the students do at the farm and why are these visits so important?

“It is interesting to carry out ecological investigations at Hörjel and compare the biological diversity there with the way it looks where modern farming methods are used. It is fascinating that there actually is a measurable difference in biological diversity between land that was given artificial fertiliser about 30 years ago and land that has not been given any at all. You also begin to understand why there were so many local sorts of cultivated crops before, as well as why certain sorts of weeds grew well and were very common on cultivated land. The students usually think it is fun to try out old farming methods like threshing and preparing flax.”

Linnaeus’s wrote descriptions from his various pro-
Go on thinking…

Go on a time-trip to the 18th century. What was it like to live as a miner or as a peasant farmer on a small farm?

The Journey to Lapland

Study Linnaeus’s route on this journey. How many kilometres did he travel? Linnaeus describes the life of the Lapps in his diary. Read more about the traditional life of the Sami: how they dressed, what they ate, what their homes looked like, and how reindeer farming worked in those days.

Read more about original populations in different parts of the world, leading a traditional life.

Give examples of how DNA analysis can be used both to investigate how the immigration of groups of people has taken place and to study the relationship between today’s organisms and those that lived a long time ago.

The Journey to Skåne

Compare how winter cattle fodder is produced today and in Linnaeus’s time. What significance does it have for biological diversity and for the environment if there is only natural manure available, as in Linnaeus’s time, compared with today, when there is almost unlimited availability of artificial fertilisers.

Great ship swings and rolls. Tight ropes vibrate in...
Linnaeus’s travels in Sweden

Linnaeus’s travel descriptions are snapshots of 18th century Sweden. He described clothing, customs, food, illnesses, buildings, flora and fauna – everything great and small. These descriptions give us an exciting perspective on our life today.