

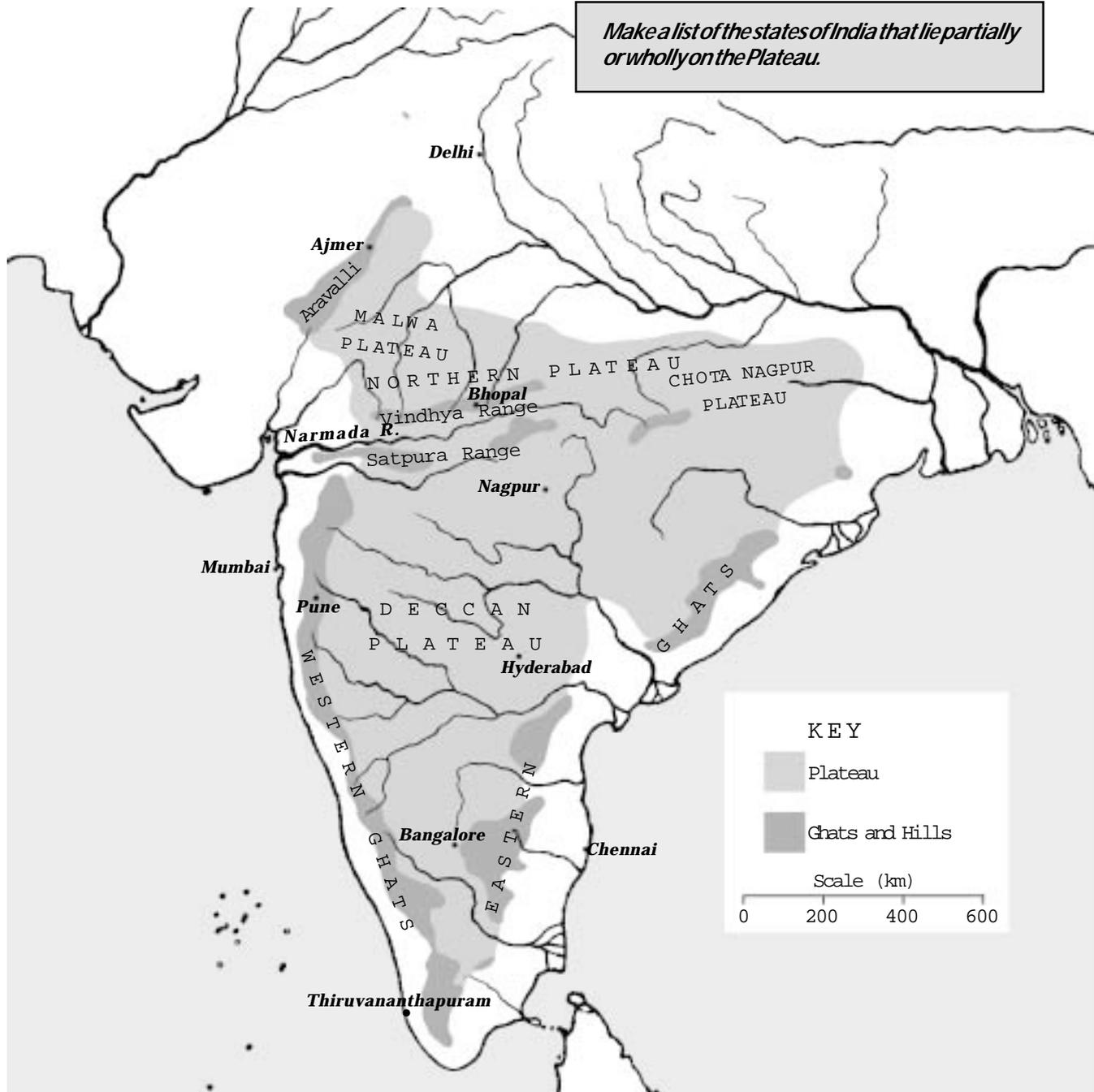
# CHAPTER 14

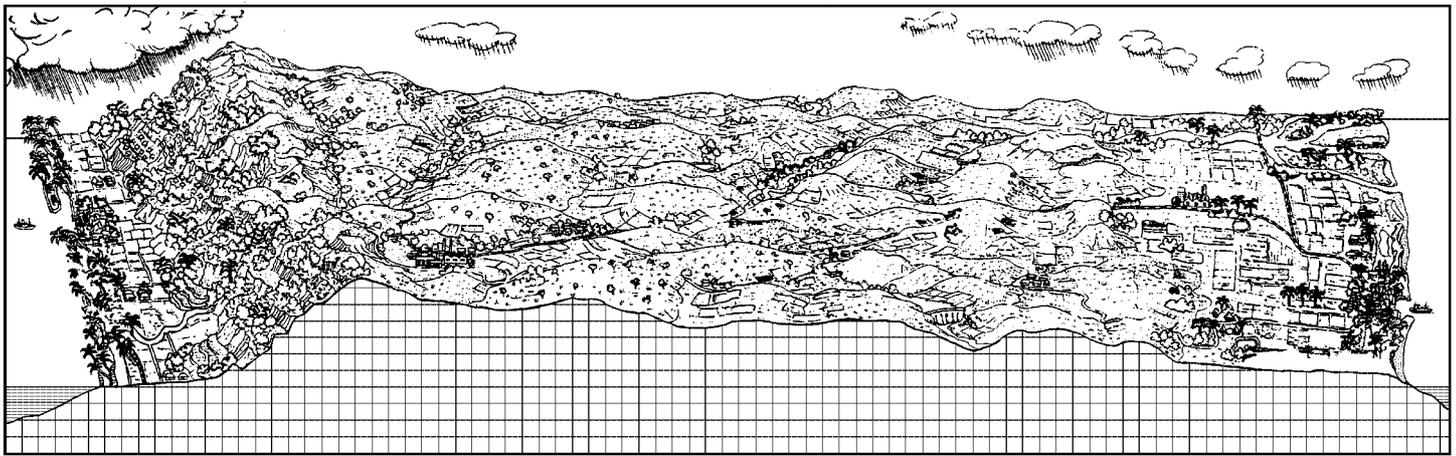
## INDIA'S PENINSULAR PLATEAU

The Peninsular Plateau is a vast area stretching over much of India. It consists of undulating land, which is somewhat higher than the coastal plains to the east and west or the flat Northern Plain of the Ganga and the Satluj. Look at a 3-dimensional plastic relief map of India to get a better idea of the Peninsular Plateau.

The large part of the plateau lying to the south of the Narmada River is called the Deccan Plateau. The part to the north of the Narmada is called the Northern Plateau, which is divided into the Malwa Plateau in the west and the Chota Nagpur Plateau in the east.

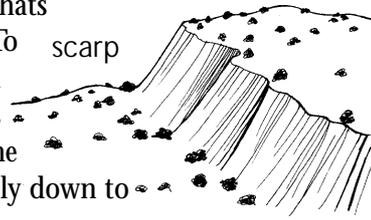
*Make a list of the states of India that lie partially or wholly on the Plateau.*





Arabian Sea West      Western Ghats      Deccan Plateau      Eastern Ghats      Bay of Bengal East  
A cross-section of the Deccan Plateau

The Peninsular Plateau is surrounded on all sides by low-lying plains. Much of the Plateau is bordered by sloping scarps or ghats. On the western side, the scarp of the Plateau is very steep. To the east, river valleys divide the ghats into small hilly areas. To the north there is a scarp at some places and at other places the land just slopes gently down to the Northern Plains.



*The above picture is a cross section of the Deccan Plateau. Do you see boats or ships on the seas to the west and the east? Which seas are these?*

*Spot the coconut trees, fields, rivers, hills, houses and roads in the picture.*

*Run your finger to climb up the scarp from the western coastal plain, cross the breadth of the Deccan Plateau, climb down the scarp to the Eastern Coastal Plains and reach the Bay of Bengal.*

*Look at a physical map of India that is coloured according to altitudes in order to answer the following questions:*

*Do all parts of the Peninsular Plateau have the same colour on this map?*

*Does the map show any parts of the Plateau that are below 500 metres in elevation? (If so, where?)*

*The highest point on the Peninsular Plateau is Anaimudi Hill. Where is it? How high is it, and how does this compare to the highest peaks of the Himalayas?*

### ***A Journey on the Deccan Plateau***

*Open your Atlas to a map that shows the detailed physical features (including elevation) of the south of India. Put your finger at Mangalore and move eastward on the road going to Hassan, Mysore, Bangalore, and Robertsonpeth, till you reach Chennai. You crossed different heights along this route.*

*Mangalore is on the \_\_\_\_\_ coast of India and Chennai is on the \_\_\_\_\_ coast.*

*From Mangalore until almost 80 kilometres east, the elevation (the height of the land) is between \_\_\_\_\_ and \_\_\_\_\_ metres above sea level. It takes two or three hours to travel these 80 kilometres by bus.*

*After going 80 km east of Mangalore the route starts climbing steeply from a height of 200 metres to almost 1000 metres above sea level. What colours are used to denote the different heights along this climb?*

*This is called the Western Ghat - the scarp of the Deccan Plateau. Look on a map of India to find the scarp all along the plateau from north to south. Start from the area around Surat and come south till the area around Thiruvananthapuram.*

*Some parts of the ghats are high - such as the Nilgiri hills, on which the famous hill station named Ooty is located. Find four other hills on the Western Ghats.*

*Go back to your route from Mangalore to Chennai. As you go eastwards from the ghats towards Hassan and Mysore do you climb down as much as you had climbed up? What is the elevation between Hassan, Mysore and Bangalore?*

*Describe the land as you move from Bangalore to Vellore. What is the elevation near Vellore? Notice the Javadi Hills to the right of your route to Vellore. How high are they?*

*Travelling from Vellore to Chennai, does the elevation go up or down? What is the height of land near Chennai?*

*The slopes and hills you cross before Vellore are the Eastern Ghats. You cross them to reach the eastern coastal plains. The Eastern Ghats are made up of several small hills separated by river valleys such as the Palar river that flows next to the Javadi Hills. Locate four other hills on the Eastern Ghats from the north to the south of the Peninsular Plateau.*

*The Eastern and Western Ghats merge in the area around the Annamalai hills. Locate them in the Atlas.*

### *A Journey on the Northern Plateau*

*To get an idea of the terrain of the Northern Plateau, study the route from Jabalpur on the Narmada River to Allahabad on the Ganges. Describe the elevation along the route, how it climbs up or down, and which hills and towns it passes.*

*When you move from Satna towards Allahabad you cross the edge or the scarps of the Northern Plateau to reach the Northern Plains of India.*

## The Soil of the Peninsular Plateau

The soil of the Peninsular Plateau is formed by the disintegration and decomposition of its rocks. The underlying bedrock structure of Peninsular India is made of extremely ancient and hard rock. The soil it has produced is called **red soil**, the reddish colour being due to the large amount of iron it contains. Much of the Peninsular Plateau, especially the southern and eastern parts, have this red soil. It is not very fertile, but yields good crops when fertilized with manure or chemical fertilizers.

The northern, western and central parts of the Peninsular Plateau are covered with **black soil**. It comes from the erosion of volcanic rocks. Millions of years ago volcanoes erupted in this area. Lava and ash spewed out of cracks and fissures in the earth and spread out over the entire region. This turned into layer upon layer of rock. This is how

much of the Peninsular Plateau and the Western Ghats was slowly built up. This area is called the **Deccan Traps**. Over the millennia, the rock has been eroding and wearing away, producing the fine black soil. The layers of volcanic rock can be seen on eroded slopes, especially in the Ghats.

Rainwater washes the soil away from the higher areas, particularly where there is little vegetation. Thus in many places there is only a thin layer of stony soil, with the bedrock quite close to the surface.

In low-lying areas and river valleys a thick layer of heavy, black soil collects. It is very fertile and heavy, retaining water and remaining wet long after a rainfall. Since it is good for growing crops like cotton, it is also known as 'black cotton soil.'

### Rivers

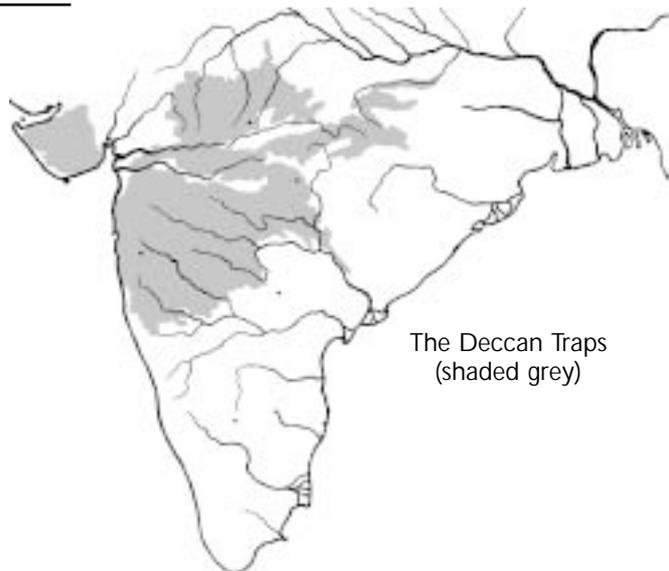
Many rivers emerge from the hill ranges. They create large flat low-lying areas of fine soil.

*Look in an Atlas and find out which rivers begin in which hills.*

#### ***Hills***

*Aravallis  
Vindhyas  
Satpura & Mahadeo Hills  
Western Ghats  
Eastern Ghats  
Maikal Hills*

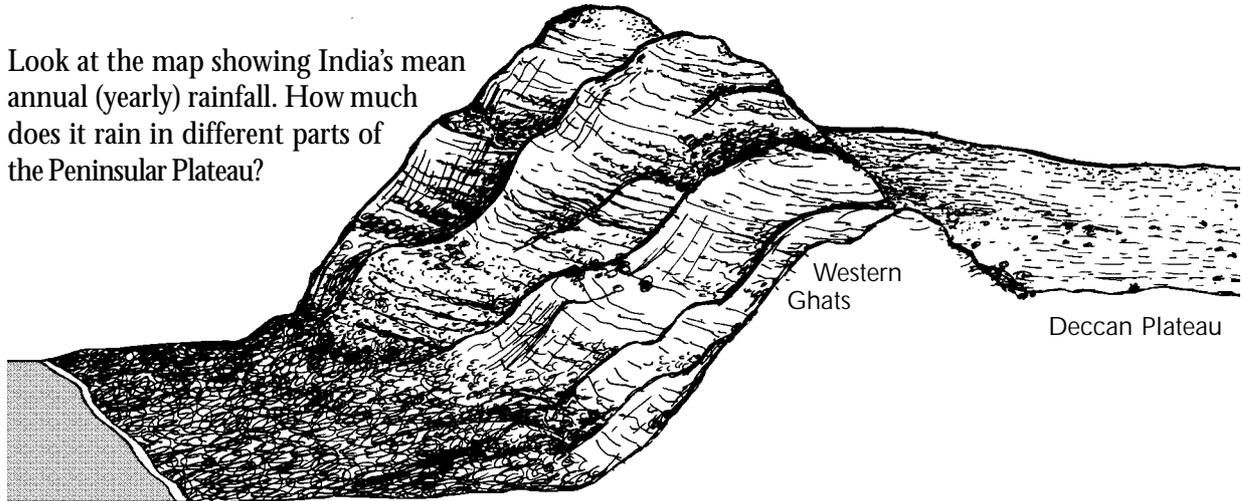
#### ***Emerging rivers***



The Deccan Traps  
(shaded grey)

# Rainfall and Water on the Plateau

Look at the map showing India's mean annual (yearly) rainfall. How much does it rain in different parts of the Peninsular Plateau?



Arabian Sea      Western coastal plain

*Compare the amount of rain that falls to the east of the Western Ghats with the amount of rain that falls to the west of the Western Ghats.*

Isn't it interesting? Why do the areas on either side of the Western Ghats get such different amounts of rain? The above picture and the following questions will help you find an answer (Refer to page 139 before you begin).

*When the wind blows from west to east, what happens to water that evaporates from the Arabian Sea?*

- It disappears forever into thin air.*
- It goes to the east.*
- It gets carried along in the air as water vapour, blowing to the west.*
- Birds drink it all up.*

*What happens to the wind when it blows east, towards the Western Ghats?*

- The wind descends down.*
- The wind causes the end of the monsoon.*
- The wind stops blowing and the air and water vapour comes to a halt.*
- The wind has nowhere to go but up, and it carries the water vapour up also.*

*Does air get warmer or cooler as it rises?*

*If warm, moist air gets cooler, what happens to the water vapour in the air?*

- It evaporates.*
- It gets saltier.*
- It remains in the air.*
- It condenses, to form water droplets.*

*Clouds consist of very fine droplets of liquid water, which form when the water vapour in air condenses. What happens if the clouds get cooler and its droplets of water get too big and heavy?*

- The water droplets fall from the clouds as rain.*
- The water droplets evaporate.*
- The water droplets rise up.*
- The clouds hold on tighter to the water droplets.*

*Where does the wind go after it reaches the top of the Ghats?*

- It keeps rising up higher.*
- It turns around and goes back down the same way it came up..*
- It descends down on the other side.*
- It stays there.*

*Does air get warmer or cooler as it falls?*

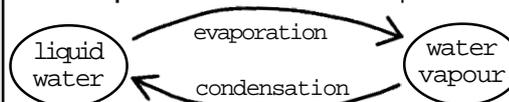
*Does the water vapour in air continue to condense if the air gets warmer?*

*A rain shadow is an area with less rain. Do you see how hills, such as the Western Ghats, create a rain shadow? Label the rain shadow area in the above picture of the plateau. Not only is the rainfall low in this area, it also*

*fluctuates from year to year. Some years there are fairly heavy rains, but then there may be hardly any rain at all for several years in a row.*

Condensation is the Opposite of Evaporation

When it gets warm, liquid water evaporates to form water vapour.



When it gets cool, water vapour condenses to form liquid water.

# Irrigation and Agriculture

Due to low rainfall the northwestern and central regions of the Peninsular Plateau depend on irrigation for agriculture. However, irrigation is very difficult because the ground water is buried deep below many layers of rock. To reach the ground water, people have to blast tube wells through metres of hard rock, and there is still no guarantee of getting water. Digging wells is therefore very expensive.

Since ancient times the people of the Plateau have built bunds to form large tanks in which rainwater is collected. They draw canals from these tanks to irrigate their fields. Such tanks can be seen in almost all villages on much of the Plateau. However, only a small area can be irrigated from each tank.

Another method of irrigation is to build large dams over rivers to make large water reservoirs. This water is taken to distant fields through a network of canals. In this way a very large area can be irrigated. Electricity can also be generated.

*Study your atlas and match each of the following dams to the river on which it is found:*

<i>Nagarjunasagar Dam</i>	<i>Mahanadi</i>
<i>Mettur Dam</i>	<i>Krishna</i>
<i>Hirakud Dam</i>	<i>Cauvery</i>
<i>Krishnarajsagar Dam</i>	<i>Chamba</i>
<i>Gandhisagar Dam</i>	<i>Cauvery</i>

However, building large dams has its drawbacks. It is not only very expensive, but it can also submerge large areas of fertile fields or forests. What happens to the people who are living in the areas that get submerged? Furthermore, digging canals through the uneven and hilly terrain of the plateau is very expensive. Even the fields have to be levelled before they can be irrigated. All this adds to the cost of large irrigation projects.

The Narmadasagar and Sardar Sarovar dams being built on the Narmada river are being strongly resisted

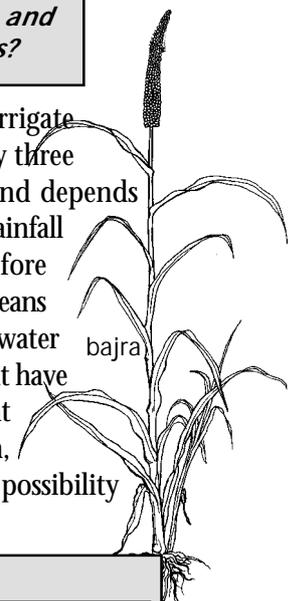
by the people who are insisting that the protection of the environment and the welfare of the displaced people needs to be given priority over the goals of increasing agriculture and industrial production.

*Why is it difficult to dig wells in a plateau?*

*What are the advantages and disadvantages of irrigating with tanks?*

*What are the advantages and disadvantages of building large dams?*

Since it is difficult and expensive to irrigate fields in the Peninsular Plateau nearly three fourths of the land is not irrigated and depends solely upon rainfall. But as you know, rainfall in most of the Plateau is scanty. Therefore dry land agriculture is practiced. This means that farmers plant crops that need less water and can survive droughts. In places that have little irrigation and are solely dependent upon rainfall, failure of the monsoon, or its delay, means crop failure and the possibility of a famine.



<b>Main Crops</b>			
<b>Western Ghats &amp; Western Deccan</b>	<b>Eastern Deccan</b>	<b>Malwa Plateau</b>	<b>Chhotanagpur Plateau</b>

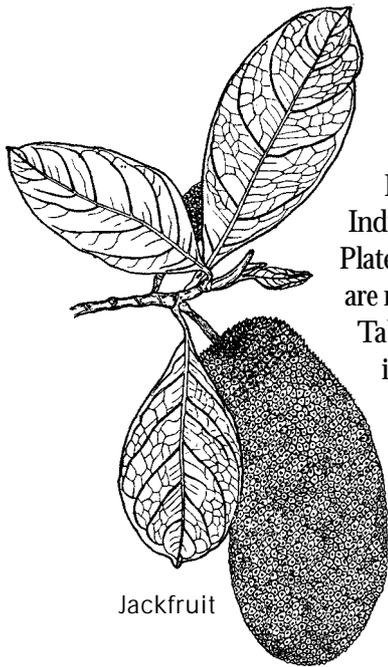
*Refer to an Atlas and fill in this Table to show where each of the following crops are mainly grown.*

<i>rice</i>	<i>jowar</i>	<i>coconut</i>
<i>wheat</i>	<i>barley</i>	<i>sugarcane</i>
<i>bajra</i>	<i>ragi</i>	<i>tea and coffee</i>
<i>cotton</i>	<i>oilseeds</i>	<i>spices (cardamom and pepper)</i>
<i>tobacco</i>		

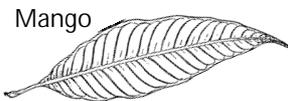
*Can you think of explanations for the cropping pattern that you see in the Table you filled up? It may not be easy because many factors influence the decision of what is grown in each place. What are the kind of questions that come to your mind in this regard?*

# Forests

Look at the map showing the forest cover in India. You will find that many parts of the Peninsular Plateau are covered with forests. But, all these forests are not of the same kind, as shown in the following Table. The leaves, flowers and fruits of some of the important trees from the different areas are shown here.



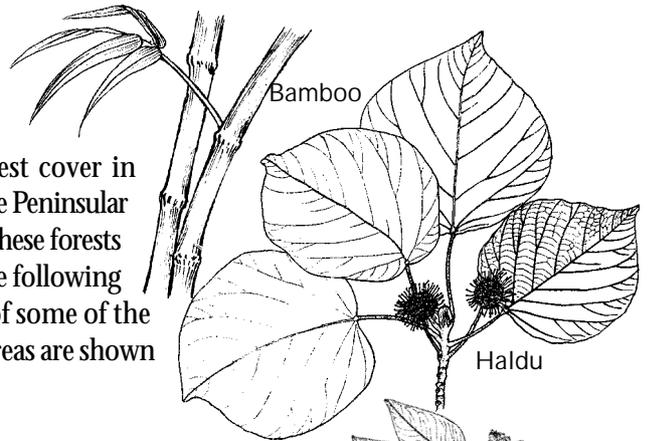
Jackfruit



Mango



Babool



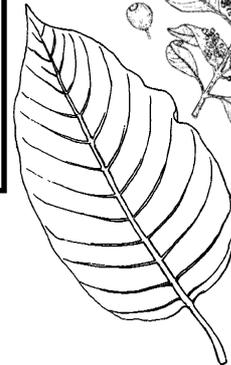
Haldu

## Types of Forests

Western Ghats	Central Deccan	Eastern Deccan
<b>evergreen</b>	<b>Dryscrub</b>	<b>deciduous</b>
kadam haldu mango sandal	babool bael palm	sal teak



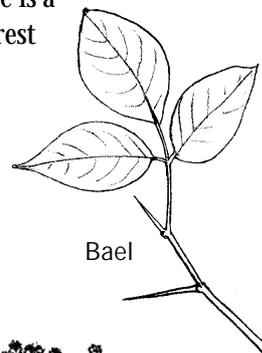
Sandal



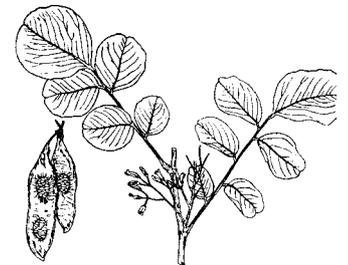
Kadam

An **evergreen** forest is one in which the trees do not shed all their leaves in any one season, so the forest remains green throughout the year. An evergreen forest usually has a large variety of trees and some of them are very tall. Besides this there is a lot of other vegetation, making the forest quite dense.

*Can you think of any other distinguishing feature of such forests which you may have read about earlier?*



Bael

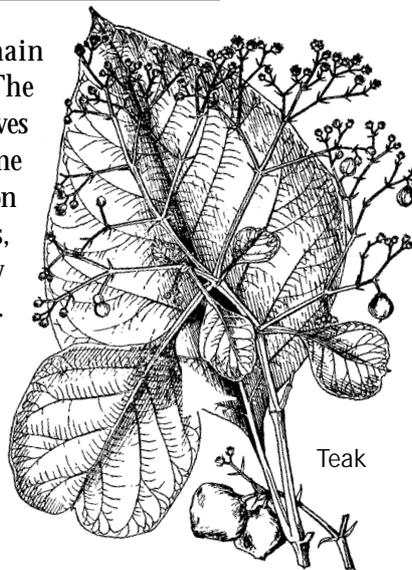


Rosewood

In a **deciduous** forest the trees remain without leaves in a certain season. The deciduous trees in this region shed their leaves at the onset of summer and they become green once again by the time the rainy season begins. Compared to evergreen forests, there are fewer varieties of trees and they are not as tall. The forest is also less dense.



Sal



Teak

*Try and identify what kind of forest is grown in high, medium and low rainfall areas.*

*Name some evergreen and some deciduous trees that you have seen growing in your area. At what time of year do the deciduous trees you have seen shed their leaves?*

# Mining

Many metals such as iron, aluminium are found as minerals in combination with other elements. When a mineral is found in sufficiently large quantities, so that mining is profitable, then it is referred to as an ore. An ore has to be processed, i.e. crushed, washed and chemically treated and smelted to get the metal.

*Look in your Atlas to find out what are the main regions (Coastal Plains, the Peninsular Plateau, Northern Plain, Himalayas or Thar Desert) where each of the following minerals are found.*

<i>Coal</i>	<i>Manganese ore</i>
<i>Iron ore</i>	<i>Limestone</i>
<i>Bauxite</i>	<i>Petroleum</i>

You can see that most of the mineral wealth of India is to be found in the Peninsular Plateau. Many of the areas rich in minerals are also thickly forested and inhabited by adivasis. Adivasis had been making use of these minerals even before the British ruled India. They used the iron ore found on the surface to prepare good quality iron and steel.

When the British established their control over this region, they surveyed the mineral resources of the area and opened many mines. After India became independent a large number of new industries began to be set up. These required large quantities of minerals. As a result many new mines were opened in the forest regions of the Plateau. These days mining is a major occupation there.

How are ores of minerals mined? Who are the

labourers who work in these mines? Under what conditions do they work under the ground? What kinds of changes are occurring these days in the way mining is done? In order to find answers to these questions, a number of years ago my friend and I went to Parasia, a famous coalfield of Madhya Pradesh.

## The Coalfields of Parasia

We boarded the Pench Valley Passenger from Itarsi railway station. This train goes from Bhopal to Chhindwara. Parasia is in the valley of the Pench river in District Chhindwara. That's why the train is also named the Pench Valley Passenger. There are huge deposits of coal in the valley of the Pench river and there are several coalmines there.

On reaching Parasia we were received by our friend Ganga Prasad who works as a miner in one of the coalmines. He had promised to show us the mines.



The mining town of Parasia, Madhya Pradesh

Parasia is a small town mainly inhabited by traders and officers and clerks managing the mines. As you go out from the town, you can see the mines, around which are settled the tenements of the miners. These settlements have their own names, like Newton Chikhli, Chandameta, and Ravanvada.

Ganga Prasad told us that for miles around the whole area, there is coal in the ground below. Mines have been dug at different places to extract this coal. I was really surprised when he told us that right below our feet, at a depth of some 30 to 60 metres, miners were digging coal and sending it to the surface.

"See that tall structure over there - that's the entrance to the mines," said Ganga Prasad. "This is the mine I work in. Come on, I'll have a pass made for you and take you down into the mine."



The entrance to the mine

## Preparing to Enter the Mines

We had a pass made by the manager of the mines. Before being given a pass we were asked to sign a statement. It said that we were entering the mine of our own choice, and if there was any accident there, we could not hold the managers of the mine to be responsible. When I wrote my signature on this paper, suddenly I felt very afraid. What would we do if something went wrong down in the mines?

"There is nothing to be afraid of," Ganga Prasad reassured us. "Right now there are hundreds of people working below. Nothing will happen if we are careful."

Then we went to a room which was marked with a sign saying, 'Lamp Room.' There we were given a torchlight with cells, a steel helmet and a rod. Ganga Prasad explained, "It will be pitch dark down there, and we'll need these lights to be able to see. Sometimes in the mines a loose rock or stone can fall, or our head may hit against a low roof. That's why we wear the helmets to protect ourselves. We also attach the lights to our helmets."

We reached the entrance of the mine. Actually this is a lift that carries people in and out of the mine. Eight to ten miners stood waiting for the lift - helmets on their heads, a light in one hand and the

rod in the other. All had thick boots on their feet. Each of them also had a basket and shovel.

## Inside the Mine

After some time a box which looked like a cage came up. This was the lift. Some miners emerged from it - covered with coal dust and looking like dark ghosts. We went and stood in the lift in their place. The gate of

the lift was drawn shut and it started descending, at first slowly and then very rapidly. It began to seem as if we were falling into pitch dark - into 'hell' itself. I felt very scared. After some time the lift slowed down and at last came to a halt. There were some lights where the lift had stopped. A man came and opened the gate and we came out.

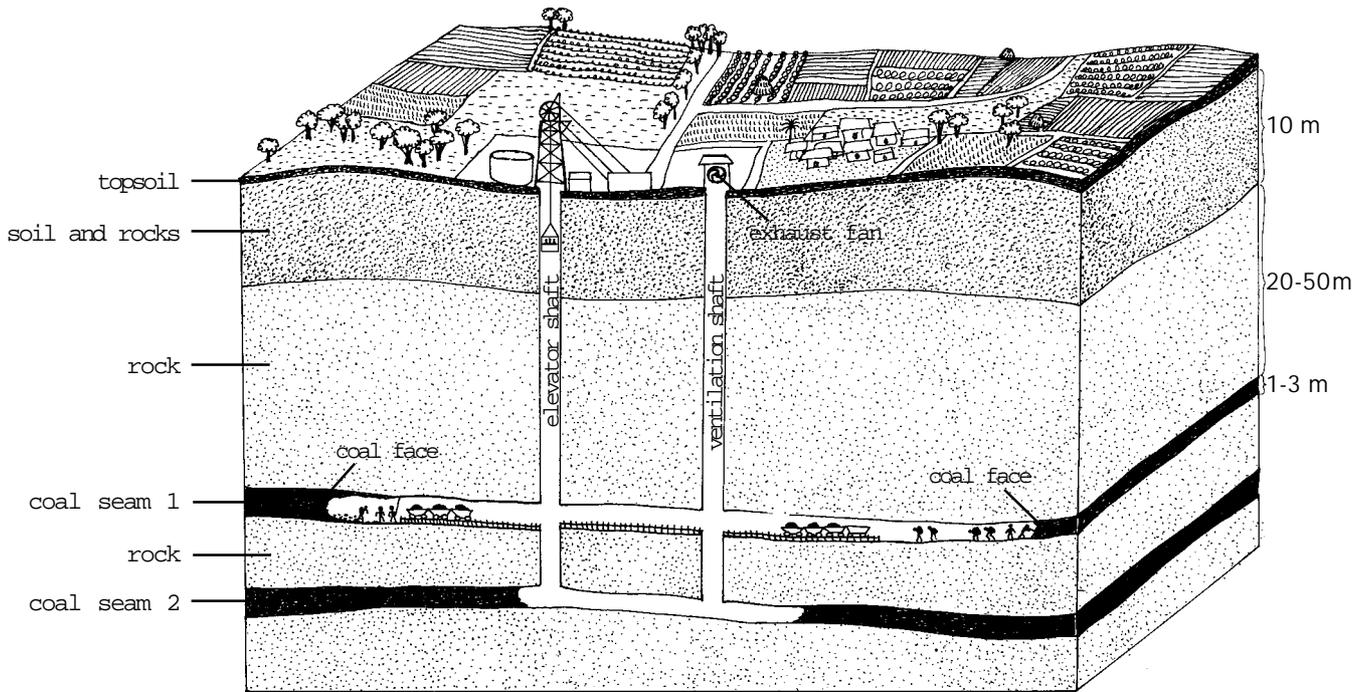
I was feeling very cold down there. I said, "How come it's so cold? I was under the impression that it would be very hot here."

"We'll explain that later. First stand aside - see, trolleys carrying coal are coming this way," Ganga Prasad said. We had been standing on rail tracks. Four or five trolleys were coming towards us on the tracks. They were loaded with coal. One of the trolleys was loaded on to the lift, which then went up. Now we began walking into the tunnel of the mine.

## The Question of Safety in the Mines

"This tunnel has been made by cutting out the coal," Ganga Prasad explained. "There is rock above and below. But on both sides there is coal."

"So there is rock above! Heavens! We'll be smashed if it falls on us!" I exclaimed.



**An Underground Mine:** Do you see the elevator shaft through which the miners go in and out of the mine? Coal is carried by rail and sent up the elevator. Air goes in the elevator shaft and goes out the ventilation shaft.

"That is a very real danger in working in the mines," one of the miners walking with us said. "Sometimes the roof does fall suddenly! Then the miners working below get buried in the debris. Or the debris could block the tunnel that leads out of the mine. Then people can get trapped inside and slowly die of suffocation, thirst or hunger."

Listening to all this as we walked along sent shivers down my spine. Ganga Prasad said, 'Many wooden pillars and beams have been placed throughout the tunnel to prevent such accidents. The pillars support the roof. As soon as the coal is dug out, pillars are placed in the tunnel to support the roof.'

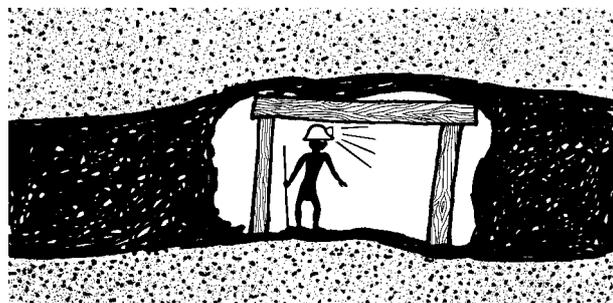
I was staring at those pillars when suddenly I heard the sound of running water. In a moment I saw that water was leaking from the walls and roof and in fact flowing like a rivulet on the floor of the tunnel. I was startled. I asked, "What's this water doing here?"

"When we dig a well, don't we find water? It is the same water - this is ground water," Ganga Prasad explained.

After walking for quite some time we reached the face of the mine. The 'face' is the place where the coal is presently being dug. There was so much heat and moisture near the face that the miners and I were soon bathed in sweat. It felt as if we were inside a furnace.

"Now you feel hot, don't you!" Ganga Prasad said. "In the other parts of the mine it was cool because air was flowing there. The shaft with the lift in it also brings fresh air into the mine. There is another shaft with a very large fan that sucks out the warm air from below. This maintains a supply of fresh air in the mine and it also remains cool. That's also why we don't feel suffocated. But at the face, there isn't enough space for much air to flow, so that's why we feel hot here."

Wooden pillars and beams are placed inside the mine to keep the tunnels from caving in



## Blasting the Coal Out

I began to observe the work at the face. Two or three miners were drilling deep holes into the wall. Ganga Prasad explained that the coal would be blasted off with dynamite.



A long drill is used to make a hole for the dynamite

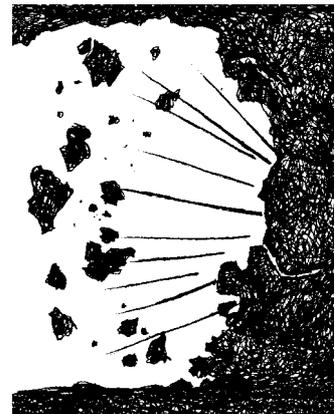
After 8 to 10 holes had been made they were filled with explosives.



Preparing dynamite sticks for blasting the coal out

A bell rang to remind everyone to clear out of that area. Then there was a whistle. Suddenly the whole mine resounded with the boom of an explosion. The walls and the ground shuddered. It seemed as if an earthquake had hit the spot!

After some time the whistle sounded again and we moved once more towards the face. A cloud of black dust had gathered there. Slowly, the dust settled. Coughing in the dust, two or three miners entered the cloud. They walked over the coal that had fallen in the explosion, using their rods to inspect the places from where the coal had fallen. At one spot the roof was weak, so it was supported with posts.



## Filling the Coal into Trolleys that Carry it out of the Mine

Meanwhile six or seven miners came with baskets and spades. Ganga Prasad and I also went along with them. Their job was to fill the trolleys with coal. This was a lot of hard work. In the terrible heat of the face they had to fill their baskets with the heavy coal that had fallen in the blast, and carry it on their backs some 50 meters to dump it in a trolley. Then they had to come back for another basketful - not an easy task at all.



Carrying a heavy basket of coal to the trolley . . .  
In some places the roof of the tunnel is so low that the miners cannot stand up straight

I was not able to take more than two baskets, and I watched Ganga Prasad and the other miners in amazement.

They said, "What, tired already? And every miner has to fill at least three such trolleys every day. If we fill more than this, we get paid extra money. So we usually fill some 10 to 15 trolleys in a day."

When five trolleys had been filled a supervisor came and noted it in his notebook. Then he sent a signal through a switch fixed on the wall, and a steel cable began pulling the trolleys away.

## The Chasnala Mine Disaster

Taking a breather, the miners sat down in a corner. There was too much water below so I sat on a piece of coal. One of the miners said, "This water that you see is very dangerous for us. Let me tell you. A horrible accident happened some years ago in a mine called Chasnala in Bihar. The miners were working in the mine. There was an empty mine nearby that was filled with water. Somewhere a wall of coal suddenly collapsed and the water from the

abandoned mine rushed in like a flood. Before anything could be done, more than 400 miners got drowned in minutes."

"Oh, all that happened in the old days," another miner said. "In those times mines were run by contractors or private companies. After 1973, the government has taken all the mines into its own hands. Now there is more emphasis on safety. Earlier the owners only wanted more production. They were hardly bothered about the safety of the mines and the miners. Roofs collapsing, flooding, air fans stopping - all these things used to be very common."

"But even now there is carelessness," Ganga Prasad said. "In the rules it is written that after each explosive blast water should be sprinkled around to prevent the dust from hanging in the air. But who does this? The dust keeps flying, and with every breath we get specks of coal into our lungs."

By this time more empty trolleys had come, ready to be filled up, so the work began again.

## Workers from Outside

In the afternoon we went to Ganga Prasad's quarters. After some food and a little rest, we went to meet some other miners. I found out that most of the labourers here are from eastern Uttar Pradesh and Bihar. Out of a thousand, almost 600 are from outside and only 300 to 400 are local people. I was very surprised.

Ganga Prasad explained, "You see, when these mines were opened during British times, the adivasis of this region refused to work in the mines. So the company people would bring labourers from Uttar Pradesh and Bihar on yearly contracts."

"Why do you people leave your homes and families to come so far away?" I enquired.

"What else could we do?" he replied. "The big farmers had taken up all the land there. We had very little of it. Our family was large. We were totally sunk in debt. So I thought I'd earn a little bit here and if nothing else, at least I would be able to get my pledged land back. When I came here I thought of returning after a year or two. But I ended up just staying on in the mines."

When the mines were nationalised, that is, when the government took over the mines into its own hands, then the jobs of the miners were made permanent.

*These days there is a move towards privatising many industries once again. The government may allow private companies, including foreign companies, to take over some of the running of mines. Why do you think the miners are protesting this move?*



Ganga Prasad's colony, where we spent the night

## Illness and Leave

One other miner said, "Our families continue to live in our villages back home. Every year we take leave to go home."

"But how much leave do you get?" I asked.

"In a year we get 15 to 16 days of leave," he said. "But when we go to the village we stay for a month and a half or two. This means our wages are cut, but then what to do? It's not possible for any miner to be able to work round the year in the mine. They fall ill."

I had observed that the miners would keep coughing all the time. When I asked about it one of them said, "Well, you saw how much coal dust there is below. We work in that dust, which spoils our lungs. We have breathing problems. They call it, 'black lung disease'. Doing even a little bit of work leads to breathlessness."

"Can't this be treated?" I asked.

Another miner spoke up, "Black lung disease has no treatment. Actually, the law says that those who get black lung disease should get compensation of Rs 30,000 - 40,000. But the company's doctors refuse to give us a certificate showing that we have this disease. That is why we often don't get compensation."

*Why do those who enter the mine have to take torchlights and helmets?*

*How do the miners prevent the roof of the mine from collapsing?*

*How is warm air removed from a mine?*

*How is coal extracted from the wall of the mine?*

*Of all the tasks that the miners do, which one do you think is the most difficult and dangerous?*

*How did the Chasnala disaster take place?*

*What are the symptoms of black lung disease?*

*Why do the miners have to take extra leave without pay?*

The next day we went to see an open pit mine. Here there are no tunnels. Coal is removed by digging huge pits in the ground. Soil and rocks are removed in order to take out the coal underneath. Come, let's see how this is done.

## Open Pit Mines

When we arrive, we see that some land is being surveyed. The government is going to buy the land from the owners of these fields.

Then we see the huge pit that has been dug to expose the layer of coal.

In the open pit mines almost everything is being done by machines. A bulldozer is being used to remove the soil.



These fields would soon be dug up to find coal

A few workers standing near a bulldozer deep down in a pit



Rocks are being blasted with explosives to release the coal. Huge power shovels and front-end loaders are used to dig out the coal and load it into trucks.



A worker using a bulldozer to clear soil in a pit mine

The debris is also being put into trucks that take it out of the pit, where it is dumped. Big hills of this debris grow outside the mine.



A large power shovel scrapes up a load of coal (above) and dumps it in a truck (below)



The truck then takes it up out of the pit



Since so many machines are used, just 4 or 5 workers take the place of thousands of workers in the underground mines. Thus, open pit mining is cheaper because there are fewer workers to pay.

But there are many problems with this kind of mining. The first is that the machines have to be brought from foreign countries.

Often these machines break down and lie idle because spare parts are not available.

Secondly, since these machines are used, people's jobs are being taken away. The miners said that in the last 20 years production has increased many times over, but hardly any new miners have been hired. Many miners are unemployed.

Thirdly, and perhaps most important, the environment is damaged by digging the pits. The debris is piled over an even larger area than is taken up by the pits. Thus, fields and forests for kilometres around are destroyed. The fertile part of land is just the thin layer on top - the 'topsoil.' When the topsoil is dug up or buried, the land is wasted. It can't be used for farming.

"What's happened to all the people who used to have their fields here?" I asked.

One of the miners said, "I used to have my field here. When they came to know that there is coal below the ground here, I had to give up my land to the government. In return for it I was given this job and some money as well. But we didn't want to give up our fields. This land was very fertile."



Huge hills of debris from the pit rise up all around

Another miner said, "In these mines all the high paid jobs are given to people from outside who are more educated. We remain with the low paid work and even that is now threatened by mechanisation."

After talking with the miners for some time I got a ride on a truck carrying coal. The trucks carry coal to the point where it can be loaded onto trains.

I asked the truck driver what would be done with so much coal.

A front end loader dumps coal into the rail bogeys



"Well, the trains take the coal to the thermal power house at Sarni to make electricity," the driver replied.

By this time we had reached the place where the coal was being loaded onto the trains. The truck went up to the top of a mound of earth and stopped. A train stood below. All around there was coal dust in the air. Everybody who was there had covered their nose, ears and mouth with cloth. I also followed their example. When the driver raised the tipper, the coal fell straight into the train standing below.

So this is what I saw on my journey to Parasia. I returned that night, taking the Penchvalley Passenger again.

Many of the underground mines in Parasia are being closed down in recent times because most of the coal they contained has been mined out. Underground mines are not as profitable as open-pit mines. So nowadays 70% of the production of coal in India is from open-pit mines.

*Why are open mines cheaper to operate than underground mines?*

*What are the damages caused to forests and fields by open mines?*

*What is the coal that is mined from Parasia used for?*



## Heavy Industries on the Deccan Plateau

We saw how coal is mined in the Deccan Plateau. Apart from coal large quantities of the other minerals are also mined here, and are used in industries making iron, steel, cement and aluminium.

<u>Mineral</u>	<u>Used to Make</u>
iron ore	iron
manganese, coal, iron	steel
limestone	cement
bauxite	aluminium

To run industries, electricity is needed. Since plenty

of coal is available to make electricity, there are many thermal power stations on the Plateau. Electricity is also produced by water-powered generators at big dams.

Thus, due to the easy availability of raw materials and electricity, there are many metal-based industries here.

The location of these industries close to mining sites reduces the cost of transporting heavy mineral ores. The steel, aluminium and cement manufactured in the Plateau region are transported by rail to large industrial cities such as Kolkata, Mumbai and Chennai. Or they are taken to harbours where they are shipped to other places.

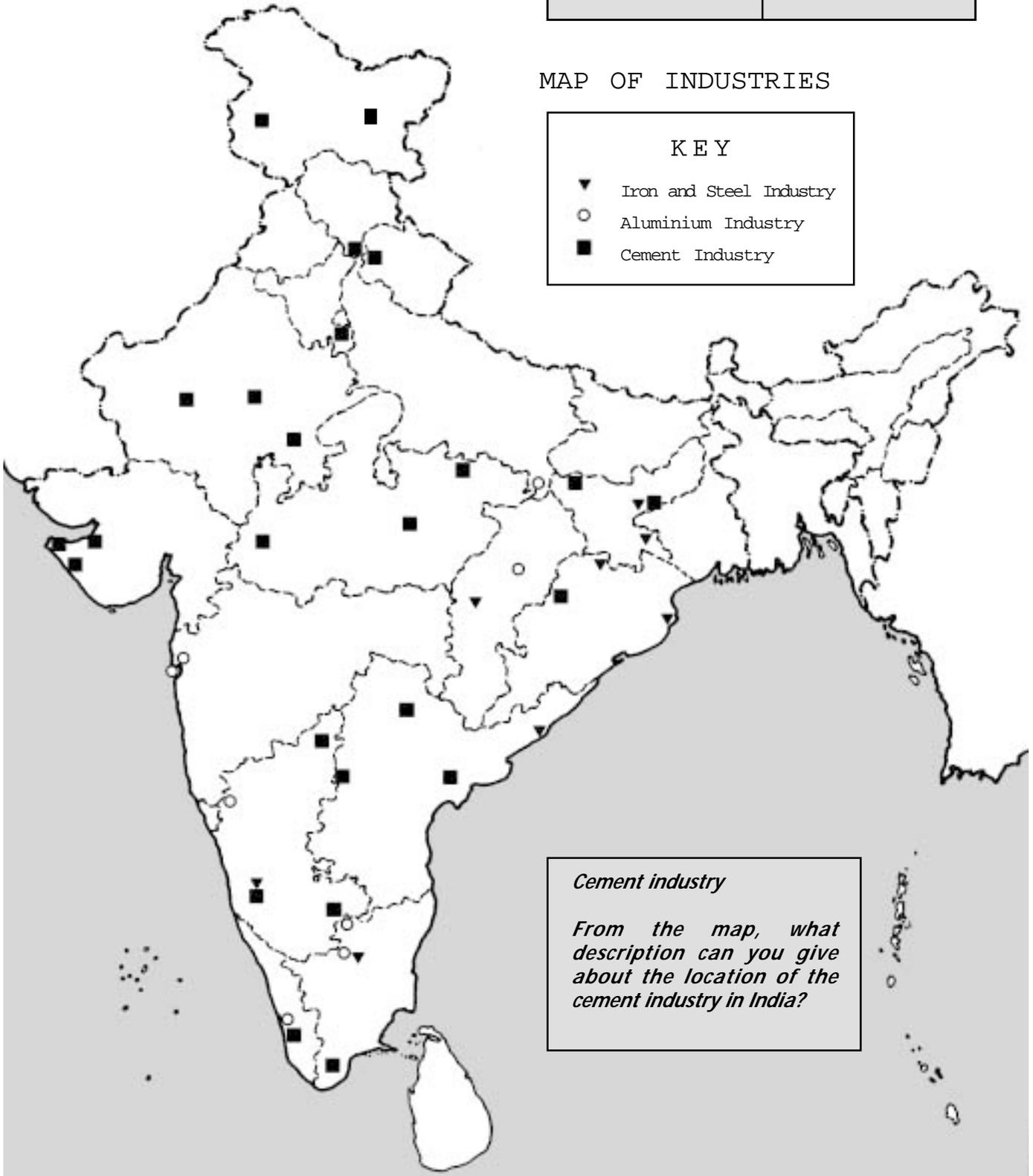
*Look at the map and fill the Table to show in which states each type of industry is located:*

<b>Industry</b>	<b>Located In</b>
<i>Iron and steel industry</i>	
<i>Aluminium industry</i>	

MAP OF INDUSTRIES

KEY

- ▼ Iron and Steel Industry
- Aluminium Industry
- Cement Industry



**Cement industry**

*From the map, what description can you give about the location of the cement industry in India?*

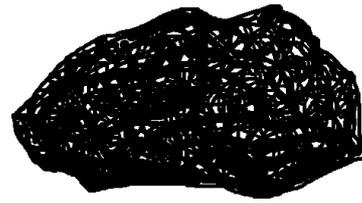
*Why is the iron and steel industry located only in certain regions of India?*

Many industries not based on metals and minerals are also found in the Peninsular Plateau. These are based on the crops grown in the fields and plantations. You can try and deduce what kind of

agro-based industries can flourish in different parts of the Plateau.

*Think of four agro-based industries of the Plateau and check in the atlas if your guesses are correct.*

Besides agro-based industries, information technology (IT) industries are also developing in



large cities such as Bangalore and Hyderabad.

*Use your atlas and name five thermal and five hydro-electricity plants in the Peninsular Plateau.*

### **Do Rocks Burn?**

Here is a piece of coal that is burned as fuel in a power plant. It looks like a rock doesn't it?

Actually it is a special kind of rock that is made from plants. Here's how:

Millions of years ago some plants in swamps died and were covered with water. Without exposure to oxygen, the plants decayed to form soft, black, carbon-rich 'peat bogs'.

Then the peat bogs got covered by silt and sand.

As millions of years went by, more layers of soil accumulated, and they pressed down on the layer of plant material. There was so much pressure that the plant material got compressed and hard. It became fossilised - formed into rocks - called **coal**!

## Exercises

- 1. Look at the rivers that flow through the Deccan Plateau. Which way do they flow? (Remember that rivers can't flow from the sea to the hills!) Based on the direction of flow of the rivers, tell which of the following is true:**
  - a) The Deccan Plateau slopes from east to west.**
  - b) The Deccan Plateau slopes from west to east.**
  - c) The Deccan Plateau does not slope.**
- 2. Which way do the rivers of the Northern Plateau flow,? Which of the following is true:**
  - a) The Northern Plateau slopes from the south to the north.**
  - b) The Northern Plateau slopes from the north to the south.**
  - c) The Northern Plateau slopes from west to east.**
  - d) The slope of the Northern Plateau is the same as the slope of the Deccan Plateau.**

3. *In some parts of the Peninsular Plateau there is deep soil while in other parts there is light or rocky soil. What are the reasons for these differences?*
4. *Why is there less rainfall on the eastern than on the western side of the Western Ghats?*
5. *Why is irrigation difficult on the Peninsular Plateau?*
6. *In which part of the Peninsular Plateau is more rice grown? Why?*
7. *In which part of the Peninsular Plateau is more jowar grown? Why?*
8. *Which part of the Peninsular Plateau would you expect has colder winters - the areas around Hyderabad, Nagpur or Gwalior? Find these cities on a map and give an explanation.*
9. *Look at the appropriate map and tell which parts of the Peninsular Plateau have the least amount of forests. Referring to other maps, give two reasons why those parts have fewer forests.*
10. *Before the British came, how did the adivasis of the Plateau use the minerals found there?*
11. *What are the dangers that miners in coalmines have to face?*
12. *Why did farmers of Uttar Pradesh leave their villages to come and work in the Parasia mines?*
13. *What use is made of the coal that is taken out from the Parasia mines?*
14. *Find out the name of at least one city or town that is located in each of the following regions. In case you have been to any of these places, tell your classmates about it.*
  - a) *The Deccan Plateau*
  - b) *The Malwa Plateau*
  - c) *The Narmada River Valley*
15. *Compare open pit mining to underground mining. What are the advantages and disadvantages of each type of mining?*
16. *What do you think are two demands that adivasis living around Parasia might make in order to improve their living conditions?*
17. *What is the difference between evergreen forests and deciduous forests?*
18. *Read the section 'Development and Problems in the Northeast' in Chapter 13 and compare the situation of adivasis of the Deccan and those of the northeastern part of India?*
19. *Why are the adivasis of the Deccan not able to benefit from the industries being set up in their*

