The Domesday Project

Alistair Ross

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COMPUTERS IN ACTION

Collecting information

Have you ever needed to collect a lot of information and sort through it quickly?

Perhaps you've done a survey at school to find out where people live, what pets they keep, or which football teams they support?

Suppose you had to find out the five most popular dinners at your school. You could make a list of all the different meals and ask each person to tick their favourite. Or you might just ask each person to tell you what they liked best.
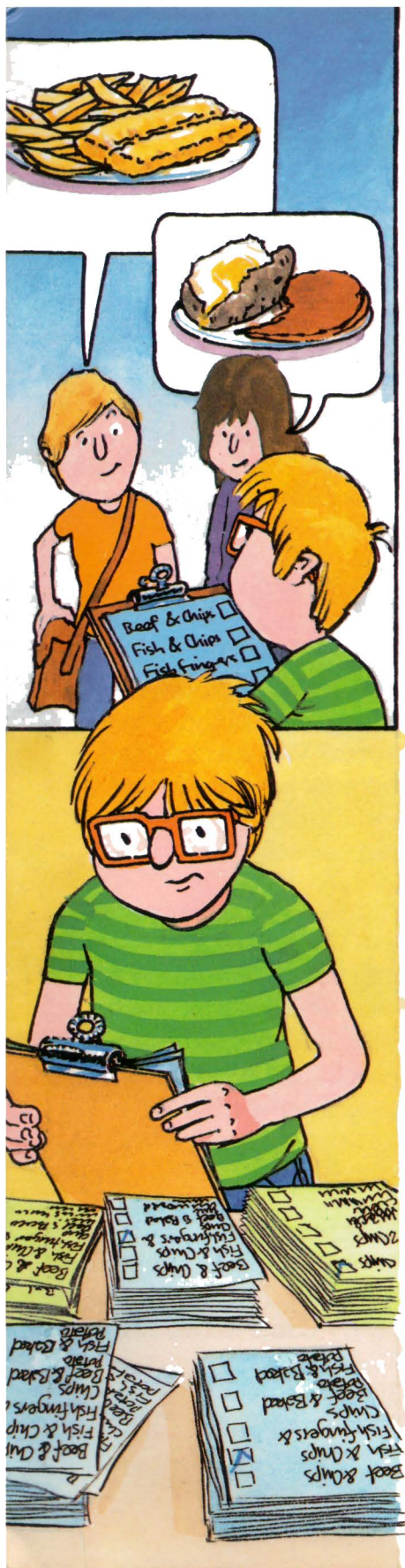
Either way, you would have a lot of pieces of paper. You would have to sort through them all and count up which meals were mentioned most. But what would happen if you found that part of your count looked like this?

Beef & Chips	48
Fish & Chips	45
Fishfingers & Chips	42
Beef & Baked Potato	41
Fish & Baked Potato	37

What's the favourite? Is it beef and chips with 48 votes? But fish got 45 votes (with chips) and 37 votes (with baked potato) so 82 people preferred it. Beef with either baked potatoes or chips got 87 votes. But what would happen if you counted fish-fingers as fish?

Sorting through information from surveys can take a long time, especially if you want to answer lots of different questions.

This book looks at one of the first surveys ever made in Britain, over 900 years ago, and at one of the most modern surveys which uses computers and video discs. It shows how computers can help us to store and sort through survey information.

The first Domesday survey

▲ A detail from the Bayeaux tapestry, showing King William talking to two of his most important landowners, Bishop Odo and Robert of Mortain

▲ The Domesday Book, in two volumes. It got its name because many people thought it would offend God to collect such information. They called it the Doom's Day survey – the reckoning for the last day of life on earth

The Domesday survey was one of the first counts of information in England. After the battle of Hastings in 1066, William became King of England. He owned all the land, and made his helpers landlords to look after much of the country for him.

In 1085, William decided to find out exactly how wealthy his kingdom was. How much land was there? How much was it worth? William needed to know how the country had changed since he had become king.

Teams of officials were sent to record information about each town and village. Each team had the same list of questions to ask. This should have made it easier to compare the answers.

By September 1086, all the information had been collected. It was written out by hand in two books.

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This is the information recorded about a village called Hartfield, in Sussex. It is in Latin and shortened.

And this is what it means.

In Hartfield, Walter holds 120 acres from the Count [Mortain] and pays land tax on this. Karl used to own it. There is land for three plough teams. The lord has 1½ plough teams worth of land; there are also 6 villagers and 2 smallholders who share 1½ plough teams worth of land. Also in the manor: 1 mill taxed at 4 shillings; 350 eels; 3 acres of meadow; woodland that supports 5 pigs. The value of the manor before 1066 – 40 shillings; the value of the manor when acquired by Walter from Karl – 20 shillings.

The Domesday Book was arranged under headings of 'counties' and 'landowners', so that the King's officials could look up how much each was worth. But it was difficult to use the book to find out other things. Can you think why? How could you tell how many mills there were in the whole of Suffolk? It would mean a lot of sorting and counting.

▲ Taking the census in 1851, by George Cruikshank

▼ Part of the 1871 census of Hartfield, Sussex. You can see the tick marks where someone counted up people's ages

The census

Nowadays, governments collect all kinds of survey information to help them run the country. One of these surveys is the census, a count of all the people in an area at a particular time, with information about each person.

Governments have held censuses in Britain since 1801. An official calls at each house and fills in a form which has questions about the people living there.

No. of Schedule	ROAD, STREET, &c., and No. or NAME of HOUSE	HOUSES		NAME and Surname of each Person	RELATION to Head of Family	CON-DITION	
		Inhabited	Uninhabited (U.) or Building (B.)				Ma
4	Perry Hill Farm	1		John Swift	Head	Married	
				Philadelphia Swift	Wife	Married	
				William Swift	Son	Married	
				Herbert Swift	Son	Unmar	
				Ellen Jane Swift	Daughter	Unmar	
				Louisa Swift	Daughter in law	Mar	
				Emily Swift	Grand daughter		
				Kate Swift	Grand Daughter		
				William Swift	Grand son		
				John Hoath	Servant	Unmar	
				William Ford	Servant	Unmar	
5	Butcherfield Cot	1		John Beard	Head	Unmar	
				Jane Beard	Mother	Widow	
6	Butcherfield Cot	1		Jesse Mitchell	Head	Married	
				Ann Mitchell	Wife	Married	
				Fanny Osborn	Lodger	Unmar	
				George Mitchell	Son		
				John Mitchell	Son		

▲ Modern census official

The collector puts the information into a record book. This book used to have one column for each kind of information, like name, age or job. The handwritten books were used for counting up how many people were similar.

Because there were more columns and headings than there were in the Domesday Book (which just had landowners and counties) the census could be used to answer many different types of questions. But it took a long time to store and sort the information.

Modern censuses use computers to store and sort the data. Instead of columns on a page, the information is stored on a computer tape, or disc. This store is called a data-base. It's still kept under different headings, like name and age.

AGE of Males/Females	RANK, Profession, or OCCUPATION	WHERE BORN		Whether 1. Deaf-and-Dumb 2. Blind 3. Imbecile or Idiot 4. Lunatic
	Farmer of 240 acres of Land employing 7 Men & 2 Boys	Sussex	Mayfield	
55		Sussex	Wadhurst	
	Farmer's Son	Sussex	Wadhurst	
	Farmer's Son	Sussex	Wadhurst	
29	Farmer's Daughter	Sussex	Wadhurst	
35		Sussex	Wadhurst	
6		Sussex	Seddlescombe	
4		Sussex	Hartfield	
2 months		Sussex	Hartfield	
	Farm Laborer	Sussex	Hartfield	
	Farm Laborer	Kent	Penshurst	
35	Farm Laborer	Kent	Cowden	
75		Sussex	Withyham	
	Farm Laborer	Kent	Westerham	
57	"	Sussex	Fletching	
20		Sussex	Hartfield	
2	Scholar	Sussex	Hartfield	
7	Scholar	Sussex	Eastbourne	

Using a computer data-base makes it much faster and easier to find information. Planners can ask the computer to sort and count the census records to give them the information that they want.

For example, they might need to know if more people are living beyond eighty. This would help them to plan old people's Homes. The computer would be asked to look at the heading, or field, that records 'age'. It would search through all the records, picking out those people with an age of more than eighty. At the end, it could tell us how many people there were and which areas they lived in.

ADDRESS	NAME	CONDITION	AGE	PROFESSION	WHERE BORN
Park Rd	J. Fogg	Married	30	Editor	London
Rose Ave	P. Smith	Single	81	Pensioner	Suffolk
15 Hill St.	Sam Bone	Married	42	Solicitor	Sussex
61 High St.	W. Fish	Widower	83	Pensioner	London
Frog St.	A. Toad	Single	24	Plumber	London
2 Bogg Row	J. Smith	Married	36	Teacher	Sheffield

The computer searches through the records to find all those people over eighty

It can make a list of all the people over eighty, and where they live
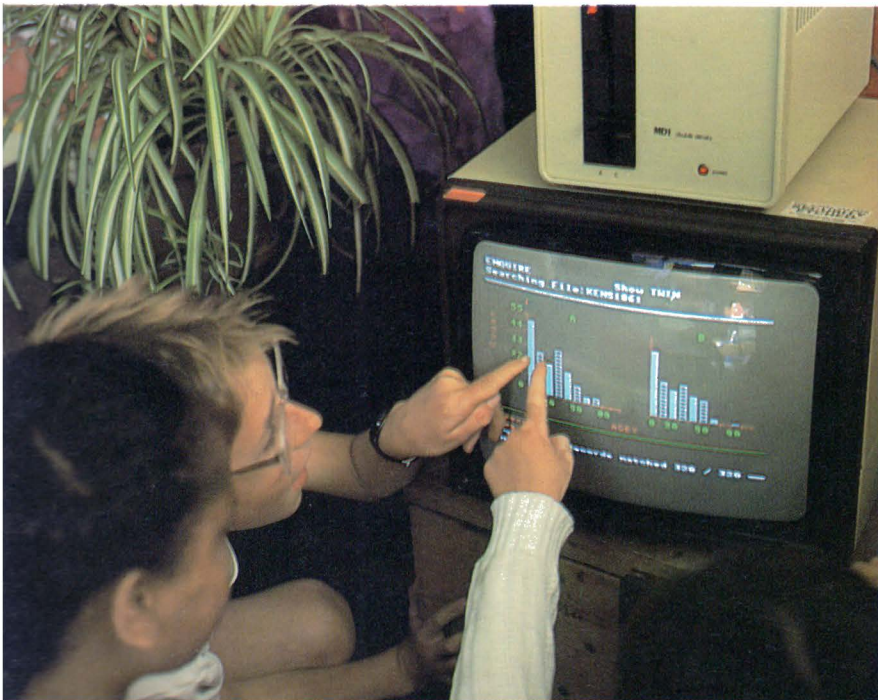
ADDRESS	NAME	CONDITION	AGE	PROFESSION	WHERE BORN
Rose Ave	P. Smith	Single	81	Pensioner	Suffolk
61 High St	W. Fish	Widower	83	Pensioner	London
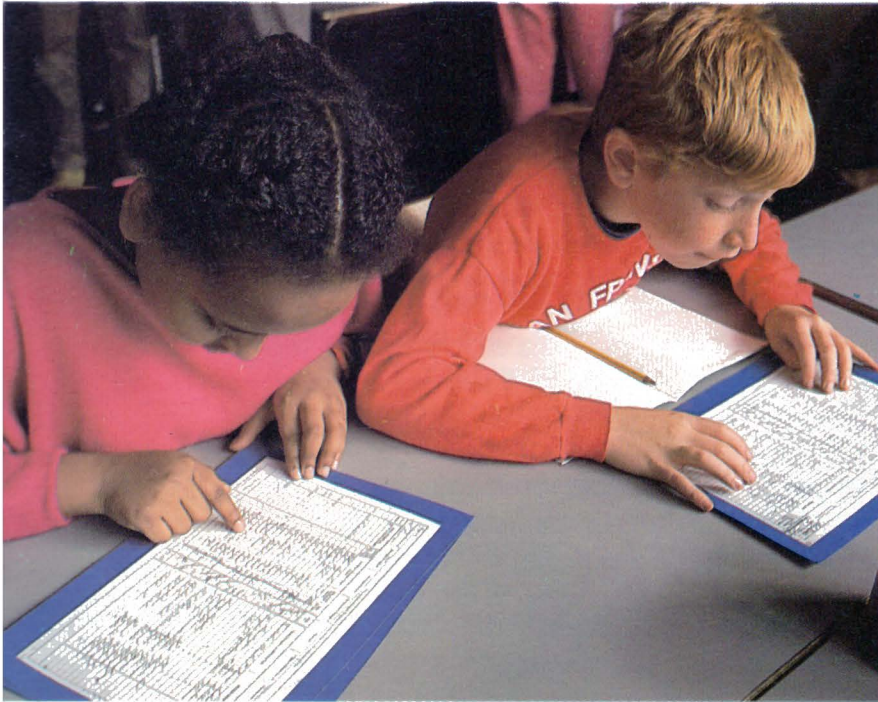
▲ Looking at old census records

▼ The computer can sort through the records and show different types of information on the screen

Census records from over 100 years ago can be seen by anyone. Some children at school now look at old census records of their own area, using a microcomputer to sort through the data. This is just the same as the census computer, except that it's smaller and stores less information.

The children read a copy of the census, and then type each record into the computer. All the information is stored on tape or disc.

Then the children can ask the computer to sort and count the records, to find out different things about people who used to live around their school. How many people were born in the area? How many people have moved there? How old were they? What jobs did they do?

The new Domesday survey

Nine hundred years after the Domesday Book was written, the BBC decided to make a new Domesday survey. The new survey would have to include a lot more information than the old one. How could it be collected?

The BBC Domesday team decided to use maps and information from lots of other surveys, and to ask schools and other groups to collect new data. They divided a map of the United Kingdom into rectangles, each 4 km by 3 km. One school, or a group of schools, would collect data in each rectangle.

In the summer of 1985, classes from all over the United Kingdom set out to survey their area. Some information came from maps and local directories, but most came from looking and asking.

▼ Looking at maps and local directories

Each school was sent a list of four different things to do.

The area they were given was divided into twelve kilometre squares. For each square, the children had to decide the three most important types of 'land cover'. What was on the land? Woods? Farms? Housing?

For each square they counted how many amenities there were. Sixty one things were listed to count, from factories to hospitals.

The schools also chose four photographs which they thought best showed what their area was like, and wrote captions to the photographs.

Last of all, they wrote twenty pages about the special things which happened in their area.

▼ Taking photographs to show places of interest

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About 14 000 schools and 2 000 other groups collected data for the Domesday survey. If all the data had been written down on paper, it would have taken a very long time to sort out!
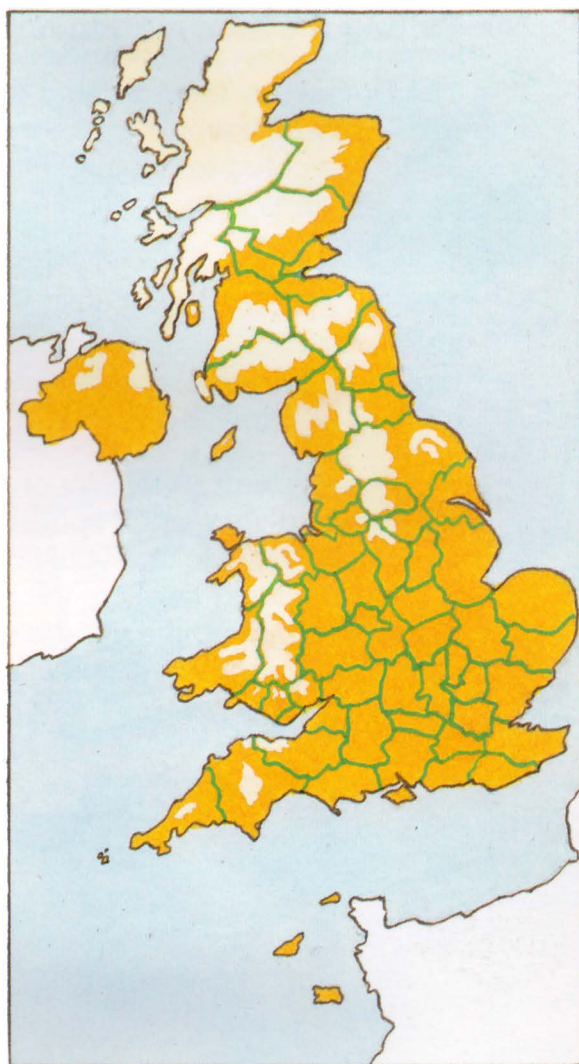
Schools used their microcomputers to record the information. Each school typed their essay and data into the computer, and the information was stored on tape or disc. Then they posted their tape or disc and their photographs to the BBC.
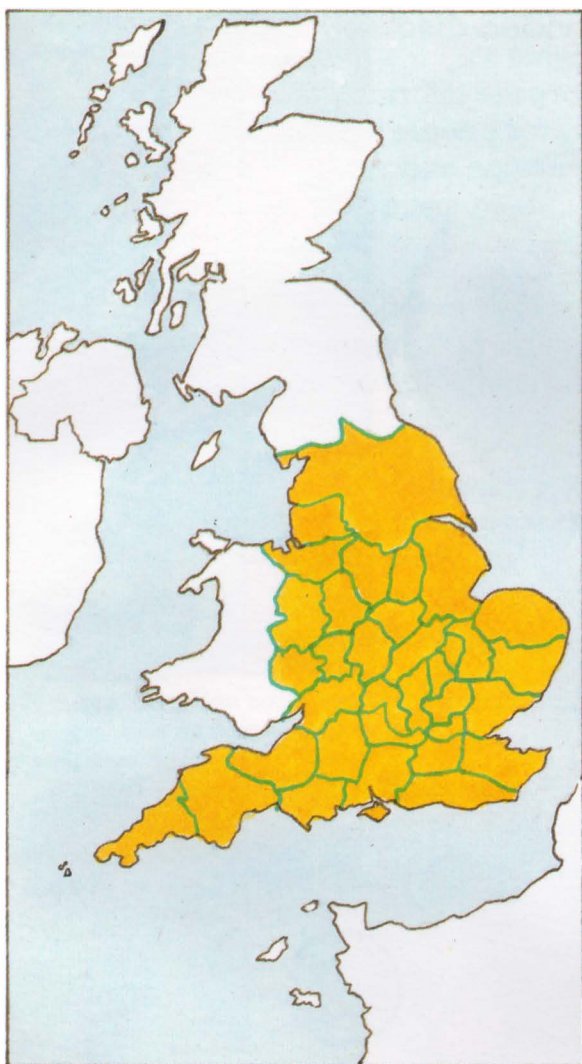
The area covered by the original Domesday survey

The area covered by the modern Domesday survey

Schools and other groups from 9 000 different areas of the United Kingdom sent in information.

In the autumn of 1985, 40 000 pictures, more than 27 million words and 7.2 million numbers arrived at the Domesday offices.
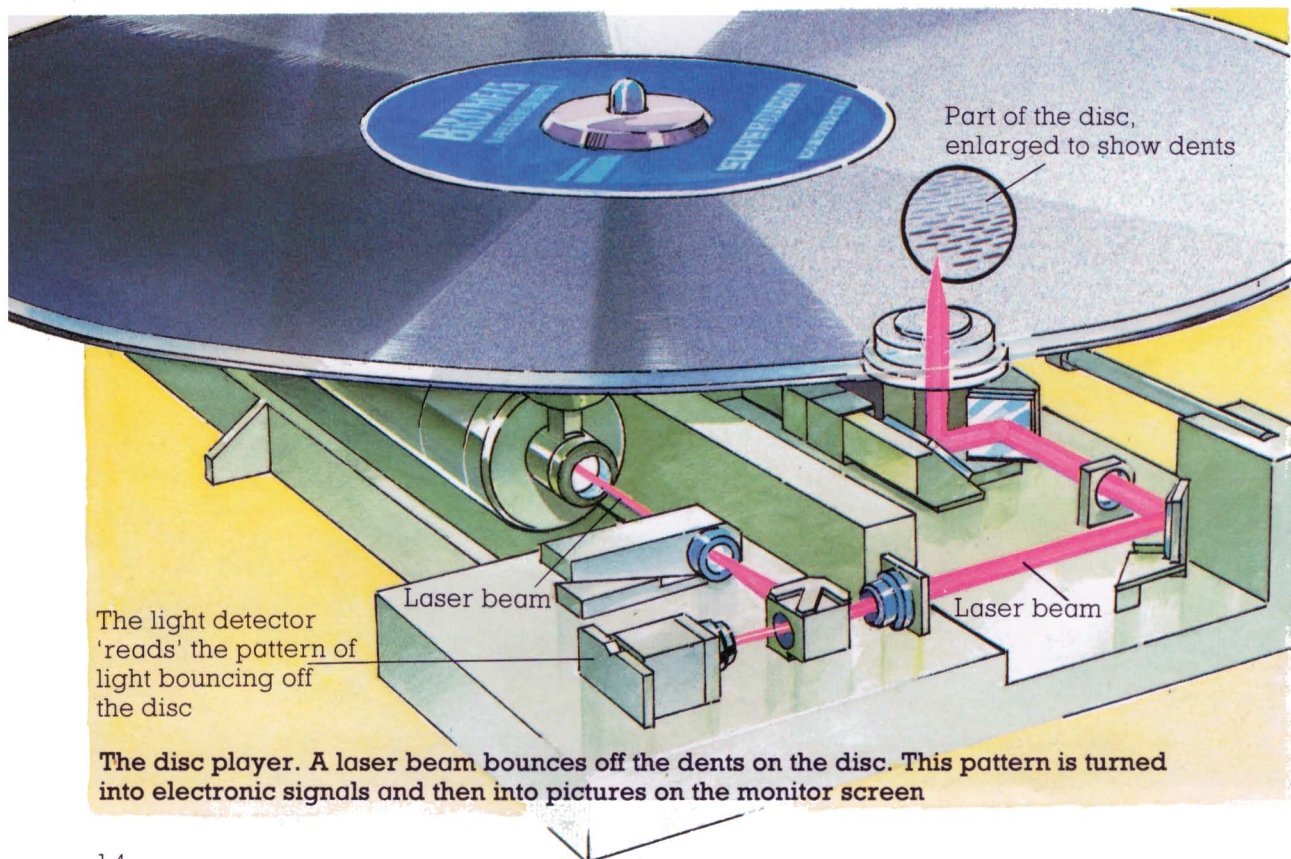
The Domesday team loaded the discs and tapes into a computer and the information was put on to two master tapes.

Putting the information on to video disc

The Domesday team wanted to store the information in a way which would make it easy for people to use, so they decided to put all the information and pictures on to video disc. This is a hard plastic disc with a pattern of tiny dents in it.

A video disc is played like a record but, instead of a needle, a laser beam reads the pattern of dents on the disc. This pattern is turned into pictures on a monitor or television screen.

A video disc can store a lot of information and pictures in a very small space, and it's easy to find the part of the disc that you want. All you have to do is move the laser beam to the right part of the disc, rather like putting the needle of a record player down on a particular track of an LP.

Part of the disc, enlarged to show dents

Laser beam

Laser beam

The light detector 'reads' the pattern of light bouncing off the disc

The disc player. A laser beam bounces off the dents on the disc. This pattern is turned into electronic signals and then into pictures on the monitor screen

▲ A video disc. You can't see the dents on it as they are only 0.00001 mm deep

The Domesday team decided to make two video discs. The *Community disc* would store a set of 25 000 maps of different parts of the United Kingdom, and all the essays and photographs sent in by schools and other groups.

The *National disc* would store the amenity counts and land cover surveys made by the schools, some more maps and photographs, short clips of moving film, and lots of information collected from other surveys.

Some of the information on the Community disc
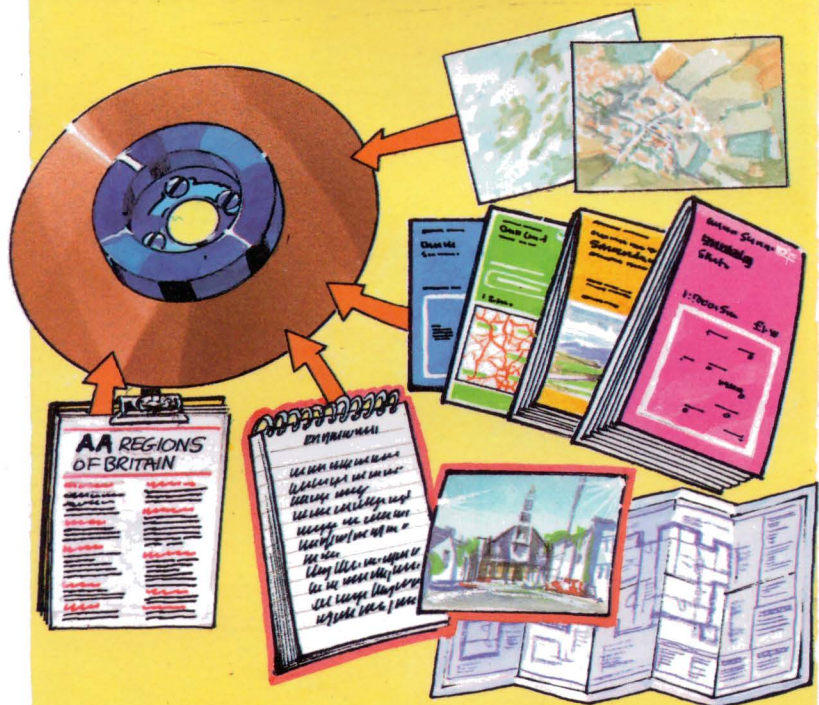
Some of the information on the National disc

Monitor

Microcomputer

Disc player

Keyboard

Tracker ball
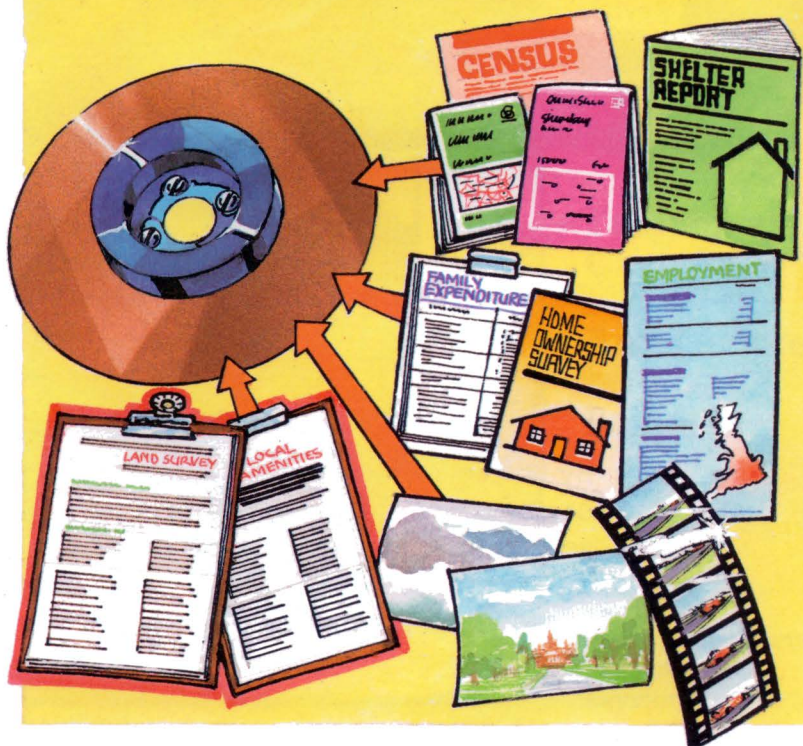
Using the video discs

This is the equipment you need to play the video discs. The disc player spins the disc and reads it with a laser beam. The microcomputer controls the player and the laser.

By typing instructions on the keyboard or moving an arrow round the screen, you can ask the computer to search the disc and find information for you. When the computer has found the information on the disc, it is shown on the monitor screen.

The problem is how to find the right bits of information. Suppose you wanted to see a photograph of a particular church in Scotland. If you played the disc slowly so that you could look at each piece of information in turn, it would take seven years to play the whole disc!

To help you find the information you want, there is an index stored on each disc. The index at the back of this book tells you which page to turn to if you want to find a particular bit of information.

The Domesday index tells the computer where to find a particular picture or piece of information on the disc. It works by storing keywords and numbers. For example, each photograph on the disc has a number that shows where on the map it was taken and four keywords which describe what the picture is about.

NS 880438

Church

Traditional Customs

Architecture

Religion

A photograph with its number and keywords

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▲ You can choose the photographs you want to see and the computer will show them on the monitor screen

Finding the information you want

When you use the Community disc, you can ask to see all the photographs with the same keyword – perhaps all the churches.
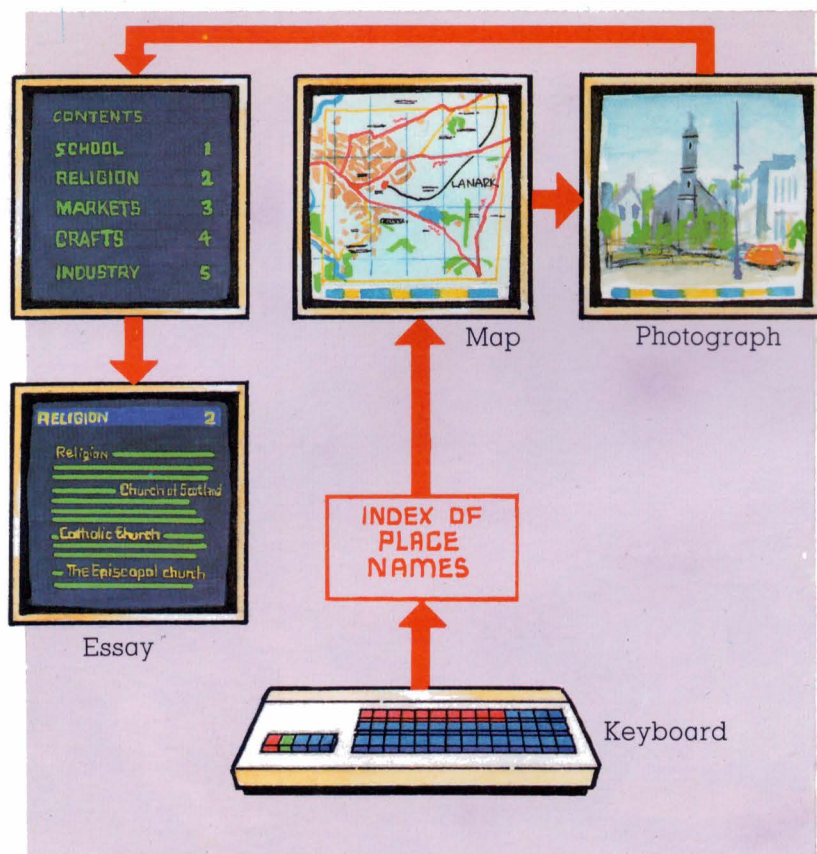
You type in the keyword 'church' and the computer searches the index to find all the places on the disc which store pictures of churches. Then it will show you a list of all these photographs.

You choose the ones you want to see, and the computer will tell the player to find these on the disc and show them on the monitor screen.
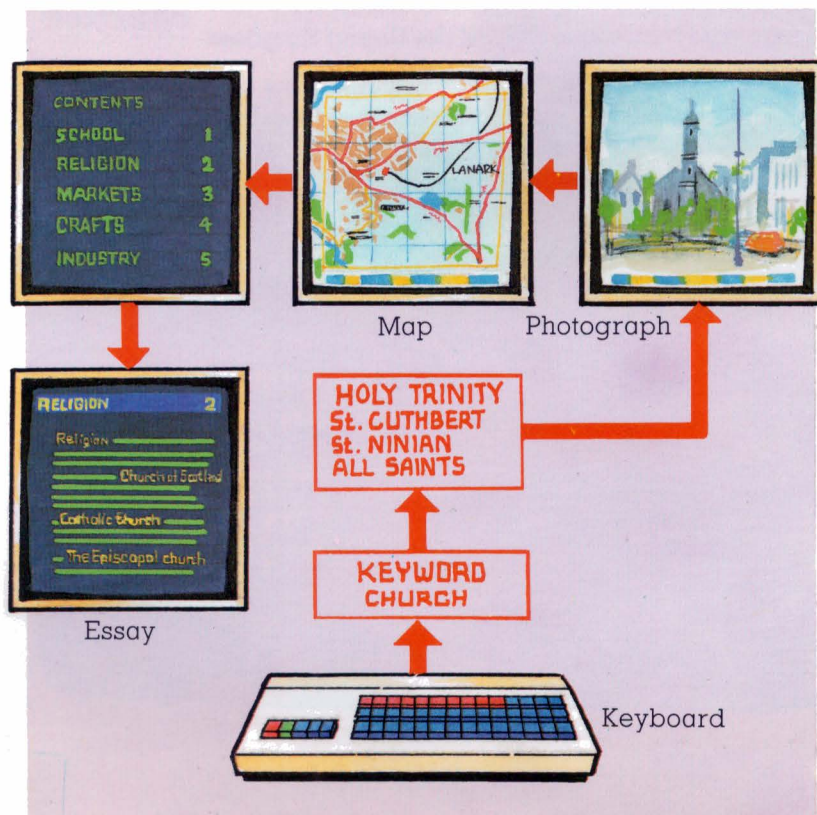
You could also look for all the pictures that have *two* keywords, perhaps all the photographs of churches that also show traditional customs.

CONTENTS	
SCHOOL	1
RELIGION	2
MARKETS	3
CRAFTS	4
INDUSTRY	5

Map

Photograph

RELIGION 2

Religion
Church of Scotland
Catholic Church
The Episcopal church

Essay

INDEX OF PLACE NAMES

Keyboard

There are many ways to move from one piece of information to another. Here are two of them

CONTENTS	
SCHOOL	1
RELIGION	2
MARKETS	3
CRAFTS	4
INDUSTRY	5

Map

Photograph

RELIGION 2

Religion
Church of Scotland
Catholic Church
The Episcopal church

Essay

HOLY TRINITY
St. CUTHBERT
St. NINIAN
ALL SAINTS

KEYWORD CHURCH

Keyboard

The index also has the name of every place in the United Kingdom. You can type in the name of a village or town, and the computer uses the index to find the map of that area. You could then ask to see a picture of that place. Then you might want to read what the local school had written about it.

At the beginning of the children's writing, there's a short contents page, so you can see what the children thought was important and choose which part to read first.

Making the indexing system was very important. It meant guessing how people would ask questions. Would they want to jump from maps to photographs? Or from text to place names? How could they do this in a way which was easy for them?

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Map walking

If you don't want to start by using the keyboard, you can ask the computer for information by using the tracker ball. The tracker ball looks like this.
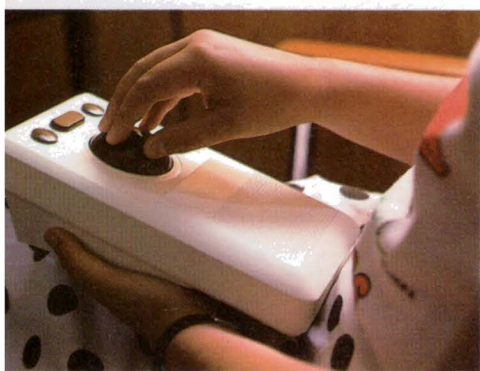
When you move the ball, it moves an arrow round the screen.

You can start by looking at a map of the United Kingdom. Using the tracker ball, you move the arrow on the screen until it is pointing at the area you want to look at more closely.

Click a button on the tracker ball and a more detailed map appears. The tracker ball has told the computer to search on the disc for the place which your arrow is pointing to.

▲ You can start with a map of the United Kingdom
▼ Then look at a map of England

After two more moves with the arrow and two more clicks, you can see a map of the 3 × 4 km area surveyed by a school. The arrow can also be used to measure distances on the map or draw an area and work out its size, so you can tell how far it would be to travel from one place to another.

The bar at the bottom of the screen explains what you can do next. By pointing the arrow at part of the bar, you can ask to see the contents page for the writing, or the photographs, or move to a map of the next area.

If you want to, you can go back to one of the bigger maps and see pictures and text about that area. You could even see a satellite picture of the area.

This is some of the information about Hartfield, in Sussex. How do you think it compares with the description made by King William's officials?

▲ A 3 × 4 km map of Hartfield

◄ Part of the essay about Hartfield

A photograph from ► Hartfield

◄ A map of the next area

The National disc

The National disc has lots more information. All the land cover surveys and amenity counts are here. The disc also has 30 000 photographs from other places, several pieces of moving film, and lots more information about the country.

Suppose you wanted to know about the different kinds of homes people live in. You could do any of these things.

1. Look at a survey to see how many people own their own homes. The computer draws a map on the screen and puts on different coloured squares. Each colour shows the number of people who own their own homes in each square kilometre.

2. Look at the land cover survey to see where there are lots of houses.

▲ A graph to show different activities which people take part in on a winter Saturday

▼ A map to show how many people own their own homes in one area of Britain
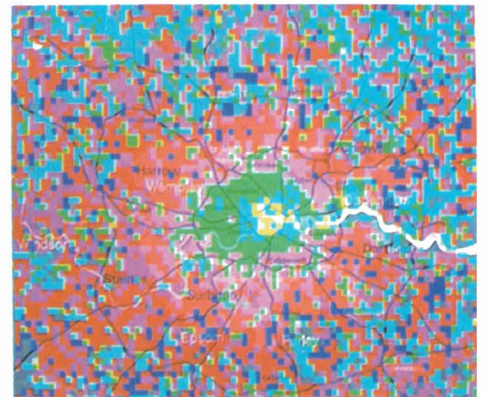
3. Read what the charity Shelter has to say about poor quality housing in Britain.

4. Make a bar chart to show where the worst housing is found.

5. Look at a set of 2 000 pictures of a house. You can use the computer to 'walk' through the house, looking in as much detail as you want – right down to what is in each drawer.

After this, you might turn back to the Community disc to see pictures and writing about housing conditions in particular areas.

'Walking' through a house ▶

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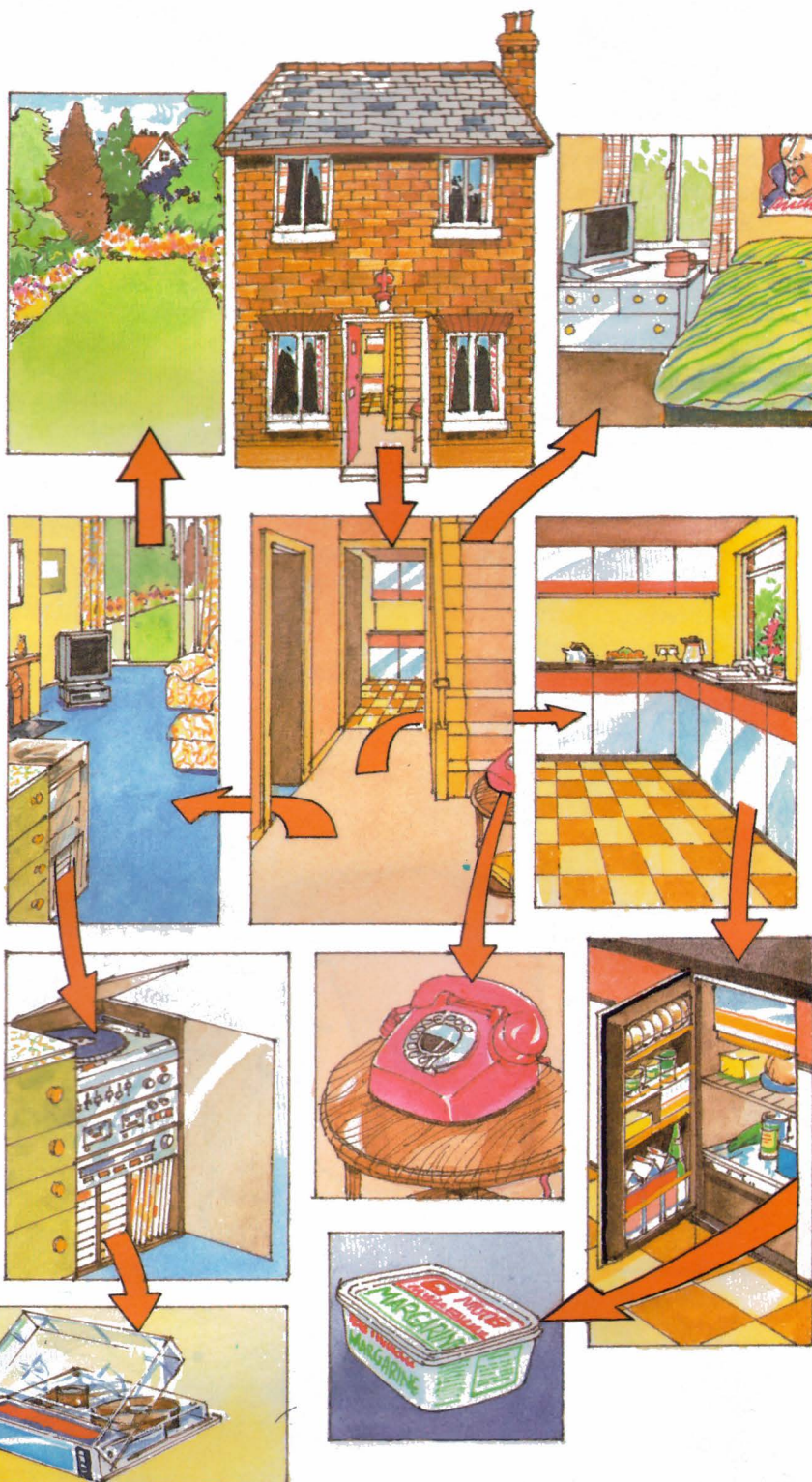
How else can this system be used?

If you were a court official in King William's time, you would have to read through many pages of writing to find the data you were looking for. It was much the same for the census workers in Victorian times.

The video system and its computer controller make it much simpler to find any bit of data from a much larger store. It's called *interactive video* because you can get the computer to release the exact pieces of information you need.

You could plan your next school journey. What does the map look like? What photographs are there of that area? What did the local children write about where they live?

You could find out about many other things, like industry and employment in your area and around the country.

How else do you think these video discs could be used? Each disc probably has as much information on it as your whole school library. Perhaps you could have all the books in your library on disc?

You can put films as well as photographs and text on to video disc. The computer could let you see the parts you wanted.

It took 900 years between the first Domesday survey and this one. It probably won't be nearly as long before the next survey. If this was on video disc, too, we could compare each area of the country to see what had changed.

What other kinds of information can you think of that could be stored on video disc?

Index

COMPUTERS IN ACTION

The books in this colourful series show computers at work in familiar situations. They are designed to help children to recognise computers in action and to explore ideas for new computer applications.

Library Computer   **The Domesday Project**

Pilot's Computer   **Traffic Computer**

Supermarket Computer   **Travel Agent's Computer**

The Domesday Project

Have you heard of the Domesday survey? It was made by William the Conqueror, over nine hundred years ago, and written out by hand in a huge book — the Domesday Book.

Now there's a new Domesday survey; your school may have collected information for it. This book compares the two surveys, and shows how computers help us to collect, store and use survey information.

£4.50 net