Chapter II

First day at school.

The morning of the next day when Bruce woke up, he did not know where he was at first. He sat up in bed, rubbed his eyes, looked around and when he saw his sister, he called to her: "I say, Alice, where are we?"

Alice turned over, gave out a little groan, sat up and threw her long hair back and rubbed her eyes. Then Bruce remembered.

"Oh, yes, of course, the plane, the ocean, the long row in the dinghy, and now we are here in THREELAND!"

"What you are saying?", murmured Alice, "Are you talking to yourself?"

"It's a bit strange", said Bruce in a more lively tone, trying to wake himself up, "all this business about threes!"

"I wonder how we shall get on with it!" put in Alice "I certainly don't want to languish in prison! Let's think about it later, I want to have another snooze! Bye-bye!"

"Look here, Alice" insisted Bruce, "we must make the best of it as soon as possible!" and he threw the blankets off and got out of bed. He went out into the passage and came up against Ata, Alo and Unta who had come to see how they were.

"Hello Bruce! How are you? Did you sleep well? Breakfast is ready", they said all at once.

Bruce excused himself, went back into the room and persuaded Alice to get up. When they were both dressed, the Koto children welcomed them and took them into the dining room. Hot chocolate was waiting on the table, and there was more of the gorgeous fruit in abundance as well as some hot croissants!

"It's nearly time to start off for school, are you both nearly ready?", asked Ata.

Bruce felt slightly annoyed, he was not keen on this idea of going to school, but since the Koto children were going, he assumed that they would have to go as well. There was simply no way out of it! Alice knew what he was thinking, so she whispered to him:

"Come on Bruce, it might be very interesting!"

"Yes, we are ready", said Alice with a smile "but we have no textbooks and no exercise books! This was intended to be our holiday, so we never thought of bringing school things! Anyway, most of our things are at the bottom of the ocean!"

"No matter", said Alo, "We will lend you everything you need. Anyway, what you will mostly need is your head!"

They each said goodbye to Mrs. Koto, Mr. Koto was already at the border crossing checking people who were crossing over. They saw one rather large car come over from TWOLAND, which stopped and the driver asked the children to get in. The road they took was narrow and full of hairpin bends, ending in a very steep hill, at the top of which Bruce and Alice noticed three buildings.

"I could have bet that there would be three buildings!" whispered Alice to Bruce.

The car stopped near one of the three buildings and the children alighted and walked towards the entrance. They noticed some numbers that were clearly visible near the entrance. There were only three kinds of digits, zeros, ones and twos, in a long row of digits, seemingly endless!

The children had to pass through a turn-stile, and each time a child passed, the number shown changed. Bruce stopped for a minute to watch the numbers change. He noticed that sometimes as a child passed, two, sometimes even three of the digits changed all at once.

"What is the point of these changing numbers?" said Alice.

"I was also wondering that", replied Bruce, "maybe it will become clearer when we have had some lessons"

They went to the Principal's office with their new friends. Unta explained to the Principal that Bruce and Alice were survivors of the recent air crash and that they would be staying with them until their parents could come and collect them. The Principal said they were welcome to the school and that they could go to the same class as Alo, Ata and Unta. He took them to the classroom where they were to be and introduced them to the teacher.

After the Principal had left the classroom, the teacher started the lesson. He spoke about grouping and regrouping, of groups of the first order, of the second order and of even higher orders. Bruce and Alice could not follow at all what he was saying. Soon all the children got up and moved to different parts of the classroom, they all seemed to know where to go and what to do! When all the commotion was over, there remained just enough places in the first row for Bruce, Alice and Alo. The teacher told them to take those places. Bruce was not surprised that the table was divided into three parts. Fortunately the teacher was speaking in English, Bruce and Alice would have been quite lost if he had spoken in the language of Ruritania!

The teacher said that the next lesson was going to be a History lesson. They were going to be studying the history of Ruritania and the events which led up to its division into States such as TWOLAND, THREELAND, FOURLAND, FIVELAND and so on.

"A long time ago", he explained "before the Revolution, all the people in Ruritania did just what they wanted and there was utter chaos and disorder everywhere. There were no laws, life was not regulated in any way, and people did not know what they could or could not do, so things went from bad to worse. The King was a good man, he could not hurt a fly, but he had no idea how to clear up the mess in which the country was!"

"One fine day a Revolution broke out. The revolutionaries decided that the King had to go, but actually no harm ever came to him, in fact he was even allowed to vote in the elections that were soon held. The person who was voted to be President of the new Republic was a great scientist, but at the same time he was a very modest person. He thought the best way to put the place in order was to divide the country into a lot of small States, as such smaller areas would be easier to govern, as each person could more easily take part in deciding how best to do things. Each State was then given a NUMBER. "

"This is how the States, known today as TWOLAND, THREELAND, FOURLAND and so on, came into existence"

The teacher did not say exactly how many such States there were in Ruritania, but he said that each State had its own laws. For example in TWOLAND everything happened in "twos", in THREELAND things simply had to happen in "threes", in FOURLAND they had to happen in "fours" and so on.

"For example, in our State", said the teacher "everything has to happen in threes. We can plant one tree, but if we plant two trees, they must not be near each other, or if they are, we must also plant a third one. If we want to plant four trees, we must plant three trees close together, and the fourth one must be planted some distance away from the first three. If we want to plant five trees, the first three must be planted close together, the fourth one has to be further away and the fifth one even further away. We can plant two clumps of three trees each, but then the clumps must not be too close to each other. We can of course plant three clumps of three trees each quite close together, in fact we can make them into a little wood, because nine trees together are allowed, as nine trees are made of three lots of three trees each"

Bruce and Alice noticed that the rules for planting trees were the same as those for building houses. They noticed this as they looked around the countryside. Houses were always built in groups of three or in groups of nine. Walking along the road, you had to keep to the same rules. You either had to walk singly, or in groups of three or in groups of nine and so on.

"You might find these rules a little difficult in the beginning" said the teacher, turning to Bruce and Alice "but you will see that the inhabitants of our State became accustomed to these rules very quickly, and I am sure you will not find the rules too hard to keep to after you have been here a few days! Later on you will be visiting Centerville, which is in the cent re of our State, where there is a big electronic machine provided with all the necessary computer programs. This machine handles nearly everything that happens in our State. For example, whenever a coconut falls from a coconut tree, a message is automatically sent to this machine, which returns another message to the trees, so as to make sure that two more coconuts fall, so that the rule of three is observed. "

Bruce and Alice found the History lesson quite amusing, but when the teacher said that the next lesson would be on Arithmetic, Bruce and Alice became quite worried. Bruce was quite good at figures, and always tried to find out how things worked. Alice liked the patterns that numbers made, and was fond of weaving stories around these patterns, which she would use for her "creative writing". So Alice hoped for some interesting patterns and Bruce hoped it would not be too hard to figure out how it all worked out.

The teacher noticed that their new guests were a little worried so he decided to start with some very easy additions. The teacher knew that in other countries people did not count in threes, but mostly in tens, although sometimes twelves and sixties came into it when time was being measured. He could not imagine how people could handle such complicated ways of doing things! He had also heard about inches, feet and yards, which were used in America, he knew that twelve inches were just as long as one foot, and that three feet were just as long as one yard.

In THREELAND all you had to know was that

one plus one was equal to two,

one plus two was equal to one zero,

two plus two was equal to one one

Once you had mastered these three simple facts, the rest was easy. When a Threelander said "one zero", he meant one group of three and no single objects; when he said "one one", he meant one group of three and one single object. So when they talked about "one one", they really meant "four". This was their way of talking about numbers, all numbers had to be made up out of these three words! Threelanders were used to counting in this way, they would not say

two plus two was equal to four

because "four" was not one of the three words:

zero,   one,   two

They would talk about "four" when they were speaking in English, but they still preferred to call "four" by the name

"one one"

"Now Alice", said the teacher "could you add one one to one one?"

Alice thought for a moment. Since one and one were two, then surely one one plus one one had to be two two.

"Is it two two?" suggested Alice a little shyly, as she was aware of all the other children looking at her.

"That's exactly right", said the teacher "but tell me, are you quite sure? Or were you just guessing?" Alice gave a little smile and then said:

"I thought that since one and one made two, it would seem to follow that one one and one one would make two two"

"That is very good reasoning", said the teacher. Then turning to Alo he said:

"Alo, can you explain to your new friend why that is the correct answer?"

"Well", said Alo "One one means that we have one group of three objects and one single object. Another one one means another group of three objects and another single object. Putting them together we have two groups of three objects and two single objects, and that is what we mean by two two. "

"I see", said Bruce and Alice almost at the same time.

"Now here is one for you, Bruce", said the teacher, "Could you add one one and two one? Try to do it by yourself!"

Bruce became very thoughtful, trying to work out the problem in his head. Then he began to think aloud:

"One one is one group of three and one object. Two one is two groups of three and one object. So together we would have three groups of three and two objects. Would that be correct?"

"Is that how it is?", the teacher asked the class. Unta put her hand up. When asked to say what she wanted to say, she said:

"It is almost correct, except that three groups of three make one larger group of nine, one we call a group of the second order. So we shall have zero groups of the first order, but there will be two singles left. So altogether we shall have

one zero two

so we can say that

one one plus two one is equal to one zero two

We must not forget to put the zero in to show that we have zero groups of the first order"

"I get it now", said Bruce "three groups of the first order are put together to make one group of the second order. I suppose if you put three groups of the second order together, you would have one group of the third order?"

"Yes" chimed in Alice "and if you had three groups of the third order, you would have one group of the fourth order!"

"That's absolutely correct", said the teacher, "I think you'd make good Threelanders if you stayed here long enough!"

"Let me give you another one", the teacher said to Bruce "Do you think you could add two two and two two?"

"Let me see", replied Bruce "Putting everything together we have one one groups of three and one one singles. That's because two plus two are equal to one one. Is that correct?"

"That is quite correct", said the teacher "Go on!"

"Now one one groups of three can be grouped into one group of nine and one group of three. Also one one singles give us one group of three and one single. Right?"

"You are on the right track!" said the teacher.

"So altogether we have one group of nine, two groups of three and one single. So the answer is one two one. Right?"

All the children clapped, as they had never had any visitor to Threeland get the idea so quickly as Bruce had done. He seemed to have learned to add Threelandish numbers in his head right away, but of course through thinking of the groups of the first, second and third orders that they described. The teacher suggested that they could have some special homework, so that they could catch up quickly with the other children in the class. He was sure that the other children would help them. Then they could take part in all sorts of interesting activities which had been planned but postponed because of the arrival of Bruce and Alice.

Soon after this the bell went and all the children got ready to go out to play in the school grounds.

Alice was not quite sure whether she had grasped Bruce's reasoning in solving the problems the teacher had given him. She started having all sorts of colored images in her head about the Threelandish numbers. She thought the nines were red, the threes were green and the singles were yellow, so each number had a different combination of colors, and you could never have more than two of any color.

Since the other children in the class started chatting in their own language, Alice went over to Bruce.

"What do you think of all this number stuff?", she asked him.

"It's not that hard to understand", replied Bruce, "You just have to think of groups of three, then if there are more than two of these, put these groups of three into three such groups, making groups of nine. Then you put groups of nine together, as long as you have just three of them, and make groups of twenty-seven, and so on. You just go on like this until you run out of things to count. When you have to write down the number, all you have to do is to write down how many of each size group there are, beginning with the largest groups. If a size is missing, you put a zero. I think that's all there is to it. "

"I don't think of it like that", said Alice,"I imagine the number in colors. At first I thought nines ought to be red, threes could be green and the singles could be yellow, but you would never have more than two of any color. You could think of flowers or trees or birds having those colors, and imagine a lovely colored picture for each number!"

"I wouldn't find that useful" said Bruce "but I can see it could be fun for you. You have always liked making patterns. "

While they were talking, they noticed the Principal, who was beckoning to them. He obviously wanted to talk to them, perhaps to make them feel at home.

"Well, well, well, I hope you liked your first few lessons. " said the Principal "I think you will have noticed that in our THREELAND, everything has to be done in threes, it is the law and everyone must obey it. Therefore you two cannot stay together, not just the two of you. You need another person to be with you. At present I am the third person, but when I leave you, you must find another child to play with you! If you want to play together in a group in which there are more than three persons, then there must be nine people in the group. If you want to make an even larger group, you will have to find twenty-seven people to play together. Another thing: don't forget that we say one zero when you say three, we say one zero zero when you say nine, and we say one zero zero zero when you say twenty-seven! That is because we only use three digits in THREELAND!"

"But of course you must already know all this" continued the Principal, "since it must have formed part of your last lesson. Look, here comes Alo, he can join you and the three of you can have a game together"

"Three of you can have a game together", whispered Alice to Bruce, trying to mimic the Principal's voice and accent and looking very cross.

"Don't forget", said the Principal, looking at the children very seriously "This is an important law in THREELAND. You will have to obey it if you are going to stay in THREELAND any length of time!"

"Please excuse us!", said Alice with a deep sigh, "we didn't do it purposely!"

"We'll do our best to observe the rule", added Bruce as the three of them ran off to play a game, which Alo was going to teach them.

Alice noticed that in fact all the children were either by themselves or in groups of three or nine, and there was one larger group, which must have had twenty-seven children in it according to the rules. Of course the Threelanders would have called the number of children in such a big group one zero zero zero!

Bruce and Alice were quite intrigued by these rules. While they were playing, they worked out that if you put three groups of twenty-seven children together to make a really huge group, there would be eighty one children in it! They looked around, but no group they could see was large enough to have that many children in it!

The rest of the day seemed to pass very quickly. Our two little survivors made a lot of new friends during the lunch hour and found out that several children from the school had been invited to the Koto's that evening for a little celebration in honor of Bruce and Alice and their lucky escape after the plane accident.

Alice was very happy about this prospect and looked forward to meeting the children. But this did not stop her wondering how long she would have to stay in this strange country before seeing her mother and father again. Bruce must have been thinking along the same lines, because all of a sudden he said:

"What do you think, Alice, are they going to keep us here quite a long time?"

"I was wondering that", said Alice "Of course it could be a lot worse. The children are really very pleasant and even the Principal isn't a bad sort. I would have thought he would be stricter. He really wants to be helpful, don't you think?"

After rather a bumpy ride and many stops for letting children off the school bus, the bus stopped outside the border post. Mrs. Koto was waiting for them and hugged them all as they got off the bus. They were the last to get off, the bus left quite empty, passed the border and disappeared round a bend of a TWOLAND road. He was going to collect the TWOLAND children whose schools finished a little later.

"I don't envy his job", said Bruce, turning to Alice "no sooner does he get used to doing things in threes in THREELAND, he goes over the border and then has to do everything in twos!"

"That's nothing!", rejoined Alo with a big laugh "We've done it hundreds of times. You just do everything in twos instead of threes. It is just like changing the side of the road that you drive on. In some States you drive on the right, in some you drive on the left. You get used to it very quickly!"

"Oh yes, I know", said Alice "In Hawaii you drive on the right, but in Australia, in England and in Japan, you drive on the left. It really doesn't seem to make much difference to the driving, only overtaking is a bit risky with the wheel on the wrong side!"

"You see", said Alo, "in the even States you drive on the right, in the odd States you drive on the left. Did you notice that our bus changed sides as it passed the border post?"

"Yes, I did notice", said Bruce, "and I also noticed him picking up two children who were holding each other by the hand! Of course, that must be the law in TWOLAND, it would be against the law here in THREELAND, wouldn't it?"

"Yes, quite so", agreed Mrs. Koto, "but tell me how you got on at school"

"It was great", said Bruce.

"And you, Alice, how did you get on?", asked Mrs. Koto.

Alice made a wry face and finally ventured to say:

"Well, it was very strange! While Bruce was working things out, I tried to make pictures of the numbers in colors, but I didn't get very far"

"That's very interesting", said Mrs. Koto, "You will have to tell us about it after we have had something to eat. Maybe Ata and Unta can help you work out the pictures. They have always been good at drawing and painting. "

"And I can work with Alo on a scheme on how to translate our numbers into their numbers and back!", said Bruce.

After having something to eat the children spent the rest of the afternoon exploring everything around the house. The girls spent some time preparing some goodies for the evening celebrations, and the boys went into the orchard to gather some of the delicious fruit that they were able to have in this warm, tropical island. Bruce became really friendly with Karo, who had flaming red hair and a captivating smile.

After the evening meal they sat down together and talked about the events of the day.

"What is the point of the turnstile at the school entrance?", Bruce said to Karo.

"Oh, that ancient machine!", said Karo "It isn't even electronic, it works on gears. It just counts the people as they come in and as they go out. When anyone comes in, the gears move forward one notch, as they go out, each person makes it go back one notch"

"But why does it only show zeros, ones and twos?" asked Bruce, but as soon as he had spoken, he remembered the morning's lesson. "Of course the machine counts the singles, the groups of the first order, the groups of the second order and so on. And I suppose every time one gear advances three notches, the next gear advances one notch, and the first gear comes back to zero. So I see that you would never need any other digits but zeros, ones and twos!"

"That's right", replied Karo, happy that he did not have to explain it himself. But Alice could not understand how the gears could possibly work as Bruce had explained.

After the evening's celebrations, when they cemented their friendships with the other children of their class, they retired to the family room and Bruce and Alice decided to discuss how they were dealing with the number problem. Alice was the first to speak.

"I was watching the children go through the turn-stile as they were leaving through the entrance. The digit on the right kept going

2, 1, 0, 2, 1, 0, 2, 1, 0, ...

then I noticed that the next digit would change every time the right hand digit went to zero, so what you saw there was

2, 2, 2, 1, 1, 1, 0, 0, 0, ...

and when the last two digits both became zero, then the third digit to the left changed, but it stayed the same while nine children passed through. I called 2 red, 1 green and 0 yellow, and during the Art class I drew a series of twenty-seven houses, each with three floors like this:

r g y r g y r g y r g y r g y r g y r g y r g y r g y

r r r g g g y y y r r r g g g y y y r r r g g g y y y

r r r r r r r r r g g g g g g g g g y y y y y y y y y

The last house means that there is nobody left in the school. The first house means that there are two groups of nine (the red ground floor), two groups of three (the red middle floor) and two single children (the red top floor). The house which is all green means that there is one group of nine, one group of three and one single child. ""This is very interesting", said Bruce, "I would never have thought of putting it down like that!"

"Well, how did you think of it?" asked Alice.

"I'll show you with a pile of beans", said Bruce "Look! I am tipping a whole lot of these beans on the table. Let us arrange them in threes", and so saying both Bruce and Alice put the beans in little piles of three beans, but there was one bean left over.

"The left over one is the single, isn't it?" interjected Alice, "so the top floor of my house is green!"

"Right," said Bruce, "Now let us find out the color of the middle floor! Put as many of these piles of three together in threes, thus making piles of nine. There are two little piles of three left over"

"My middle floor is red!" cried Alice, getting quite excited.

"And there are two sets of nine, and that's all", said Bruce.

"That means my ground floor is red too!", concluded Alice.

"And the number of beans in the pile is 2 2 1 ", said Bruce, to make sure his side of the story was not going to be neglected.

"That would be called twenty-five beans back home!" exclaimed Alice "I am really beginning to like this type of counting! If we tell the kids at home, they will never believe us that people actually count like this!"

"What would happen to your houses if we had to put three piles of nine beans together to make a pile of twenty-seven?", asked Bruce.

"We would have to have four floors instead of three", replied Alice logically. "There would be a ground floor for the twenty-sevens, the first floor would be for the nines, the second for the threes and the third floor would count the singles. "

"Wouldn't it be better to put the singles at the bottom and work up?", suggested Bruce, "Then as we need larger groups, we can put them on top instead of disturbing the whole house!"

"Count out ninety-four beans and make a house for them", Bruce said, to see what Alice would do. .

"You are trying to catch me out!" laughed Alice "you know very well that we shall need a five floor house, since we need an eighty one pile, a nine pile, a three pile and one single! So counting from top to bottom that would be:

green, yellow, green, green, green !"

"Yes and the number of beans would be:

1 0 1 1 1   in Threelandish counting!" added Bruce triumphantly.

They then actually counted the beans out and set them out on the table like this and drew the house that belonged to that number:

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o o o o o o o o o        o o o        GREEN

o o o o o o o o o        o o o

o o o o o o o o o        o o o        YELLOW

o o o o o o o o o

o o o o o o o o o                     GREEN

o o o o o o o o o        o o o

o o o o o o o o o                     GREEN

o o o o o o o o o

o o o o o o o o o          o          GREEN
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Before retiring Alice put the question to Bruce:

"Why do they have to do things so differently from us?"

"It's not that different," replied Bruce, "Just think for a moment what we do when we count these beans. We say there are ninety-four of them. What we mean is that we have nine groups of ten beans and four single beans. The only difference is that we count in tens and they count in threes. Don't you see?"

"Yes, I think I see", replied Alice "I suppose we never thought of our numbers as objects being grouped in tens, and of course in tens of tens, which we call hundreds. We just did things because the teacher told us to do them. "

"There you are then" rejoined Bruce, "it is different here. We have to think everything out, so we know exactly what we are doing and why or we cannot do our calculations. It is really simpler than what we do at home, it seems to me more logical"

"That was a good session!, said Alice, "but I think I am ready for bed!"

So they said good night to Mr. and Mrs. Koto and to Ata, Alo and Unta and retired for the night, happy that they had come to some interesting conclusions.

Now let us do some work as though we were in THREELAND.

(1) Try to imagine the school where Bruce and Alice went in THREELAND, and draw its plan, as you think it might have been. Draw a plan of the school, and a detailed plan of one of the classes. Were the tables triangular? What kind of chairs did they sit on?

(2) Suppose that in Bruce and Alice's class there were some very large groups of twenty-seven children, some big groups of nine, some small groups of three and maybe some singles.

Maybe this is how it was

1 very large group, 2 big groups, 2 small groups and one single

Is it possible that there were

two two two boys and two two two girls in the class?

Draw the groups as they might have been sitting in the classroom. You can mix the boys and the girls and put them in the same groups.

(3) If there are one zero zero boys playing a game and one of them has to go home, what must they do according to THREELAND laws? Can they stay together, or do they have to separate? If they lived on the border with TWOLAND, could they cross the border and continue to play together?

Draw the groups in which they would have to be after the one child had gone home, assuming they have stayed in THREELAND. How would you write in figures the number of children left when one out of one zero zero children had to go home?

Instead of writing the words one, two, and zero, you could write the digits 1, 2, and 0 instead. The number of boys in the big group would be written as

  1 0 0

as it is one big group, zero small groups and zero singles.

If you have two small groups and two singles, you could write

  2 2

Never say "one hundred" when you write 1 0 0 you must always call it one zero zero. And never say "twenty-two" when you write 2 2 , you must always call it two two.

  1 0 0 is only nine, not a hundred!

and2 2 is only two lots of threes and two singles = 8!

It is certainly not twenty two!

(4) Write, in Threelandish numbers, the number of people in your family, counting your father, your mother, as well as any brothers and sisters, or aunts and uncles that might be living in your house.

Imagine that you have a turn-stile at your own front door, like the one at the entrance of the school where Bruce and Alice went. Suppose there are 1 2 persons in the house, as shown by the turn-stile (that means five people, in our language) , and then 1 1 persons (four in our language) come to visit, what will you read on the person-counter by the turn-stile when your visitors have all come through? If you were in THREELAND, how would you have been grouped before your friends arrived? How would you have been grouped after they had arrived?

Imagine different numbers of people in the house and different numbers of people coming to visit. Draw the groups before and after the arrival of the visitors in each case. Draw some pictures of what happens to the groupings if anyone has to go home.

(5) If you find difficulty in drawing the people, use small objects such as beans or counters, and use different size boxes for the different size groups. . A matchbox could have three beans a pencil box could have nine and a shoe box could have twenty-seven beans. This will help you to group the people.

(6) Think of what would have happened to Bruce and Alice if they had landed in TWOLAND or in FOURLAND or in FIVELAND. What would have happened in the playground and what would the Principal have said to them?

(7) The first night Bruce and Alice had the following homework:

> (1) 1 1 + 1 1 =   (2) 2 1 + 2 1 =
>
> (10) 1 1 1 + 2 2 1 =
>
> (11) 2 2 + 2 2 =
>
> (12) 1 0 0 - 1 =
>
> (20) 1 0 - 1 =
>
> (21) 1 1 1 - 2 =
>
> (22) 1 1 1 -1 1 =
>
> (100) 1 1 1 -1 2 =

There were quite a few others, some much harder. But if you can do these, you are already doing very well!

(9) Count from 0 to 1 0 0 0 in Threelandish.

(10) Count from 0 to 1 0 0 in Fourlandish.

Don't forget that in FOURLAND they have four digits, which are   0,   1,   2,   3

and they group ,everything in FOURS! Their big group is going to be four groups of four, which is sixteen in our language. So our four in Fourlandish will be written as 1 0, our five would be written as 1 1, our six as 1 2, our seven as 1 3. Our eight would have to be 2 0, because in eight we have two small groups and no singles. Continue until you reach 1 0 0 !

(11) How do Threelanders tell whether a number is odd or even? Write a whole lot of even numbers in Threelandish, then a whole lot of odd numbers in Threelandish, you will probably notice how they are different!

(12) How do the Fourlanders tell an even number from an odd number?

(13) In Ruritania they used coins of different colors for money. In THREELAND, 3 yellow coins were worth an orange coin, 3 orange coins were worth a red coin, 3 red coins were worth a green coin, 3 green coins were worth a blue coin and 3 blue coins were worth a mauve coin.

The yellow coin was worth the same in all States, but in FOURLAND, each higher coin was worth 4 of the coins just below it, in FIVELAND you used the number 5 as the "multiplier" and so on.

Bruce worked out that

1 red, 2 orange and 1 yellow in TWOLAND was worth 1 red in THREELAND.

Then Alice worked out that

1 red, 2 orange and 1 yellow in FOURLAND was worth 1 red in FIVELAND!

Is 1 red, 2 orange and 1 yellow always worth 1 red in the State whose number is one more than the one you are in?

What would you get in FIVELAND for

1 green, 3 red, 3 orange and 1 yellow in FOURLAND money?

What would you get in EIGHTLAND for

1 blue, 4 green, 6 red, 4 orange, 1 yellow in SEVENLAND money?

If you work out these problems, you will have no trouble in understanding Bruce's and Alice's shopping problems!