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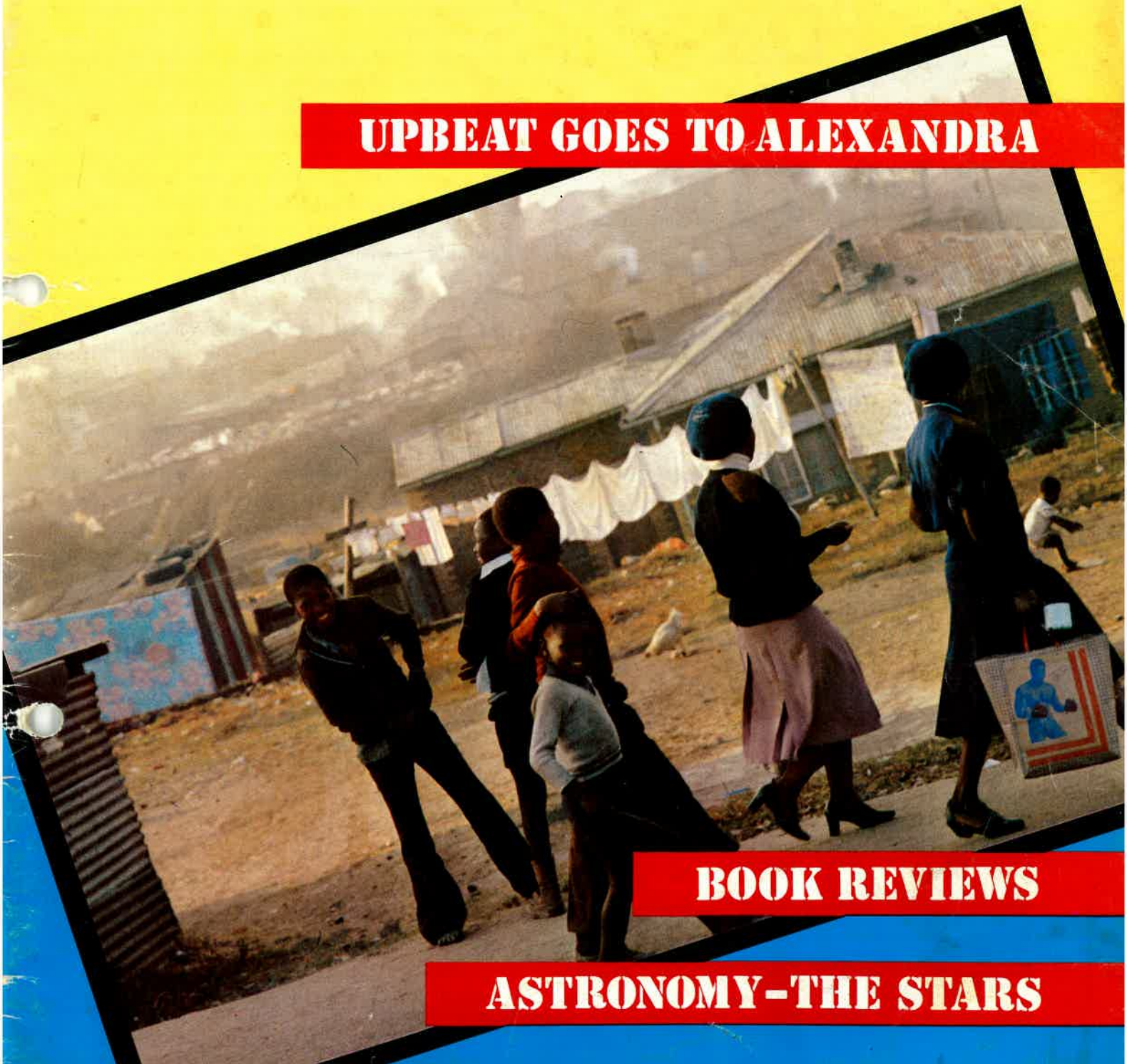
Upbeat

UPBEAT GOES TO ALEXANDRA



BOOK REVIEWS

ASTRONOMY–THE STARS

SHORT STORY BY ES'KIA MPHAHLELE

ECOLOGY–CHESS–HOW IT WORKS–PUZZLES

A LESSON FOR ALL TIME

Es' kia Mphahlele

We had come from Atteridgeville where we had visited my sister-in-law and her children, and my mother's grave. In the car were my family and a friend's daughter — our little daughter's playmate.

Winter dusk sneaked upon us at the Alexandra exit on the highway. We pushed our way through the dimly-lit streets of Orlando and Westcliff, up the slope past Phefeni, and down towards Jabavu. Here we would deliver our friend's daughter.

I was taking a deep breath, feeling relieved that we had arrived safe, when we hit the main road that crossed ours. I stopped at the sign and then gave my car more juice to cross the major road.

Ahead of us a car came careering down towards us. Its headlights were on full beam. They blinded me for a few seconds, and the car was gone, like a meteor. But in those brief seconds when I was blinded by the glare, I vaguely noticed two men in the road, on our side, the intersection already behind us. Too late! Before I was aware what had happened a dark shape was flying in the air, spreadeagled over the bonnet of my car.

Someone screamed.

When I stepped fiercely on my brake pedal, the shape hit the bonnet in its fall and slided on the left side. We rushed out of the car to find the man's head dangerously close to the left rear wheel. He was unconscious. A few seconds too late or too soon I would have run him over. His companion had been thrown onto the pavement.

All that provided light in the surrounding dark were my head lamps. One of us ran to my friend's house, a few blocks away, to call him. He in turn rushed to a neighbour who had a telephone, to call the police and an ambulance.

The man on the pavement was mumbling some words in a drunken stupor. He kept saying, *'Emisa lori, e emise monna Ke thlologe...'* — stop the truck, stop it man and let me get off...

I was numb with terror. Had I killed a person or two just because of two stupid bright lights and a stupid and reckless driver? A driver who did not even know what damage he had left in his trail...

By the time the police and the ambulance arrived the place was full of people milling about. I scarcely heard what they were saying, scarcely observed the police measure distances, scarcely heard them ask me questions. All the people on the scene could have been faceless ghosts for all I cared, so numb I was.

While the children slept peacefully, my wife and I tossed and turned in bed. It was for me a night of nameless terrors, silly, tormenting dreams about rags flying in the air and raining on a car I was driving...

We went to Baragwanath Hospital to see the men, first thing in the morning. One had been discharged the same night, and the other who hit the bonnet was still in bad shape. He had a cracked skull and they were going to insert a metal plate to cover it up. The nurses said he had thrown up plenty of liquor during the night.

The editor of the magazine for which I was working remarked about my ashen complexion when I arrived at the plant. He let me off for a few days to get over the shock. We took packages of groceries to the homes of the two men that Monday afternoon.

To our amazement their wives were not bitter or hostile at all. We were heart-warmingly received in both the homes.

In time the hospital patient was out, up and about.

Even in the midst of death or sickness or disaster or ruin, we often say, there is always some comedy that makes us laugh.

Both men came to our house in Westcliff to thank us for the groceries we continued to take to their homes. 'Call me Ra-Lesenke,' the man with the metal plate said, half mockingly. Then he went on to tell us that since the accident he had forgotten Afrikaans. All that he had ever known. Unable to swallow my laughter, I said to him, 'That's no big loss! We grieve only that you had to be fixed with a zinc plate.'

In the magistrate's court my lawyer explained that I had been blinded by the full lights of an oncoming car. The streets were unlit. Vision before I was blinded was poor because of this. The marks on the scene did not indicate that I had driven so fast as to draw long tyre marks on the tarmac.

The men were decidedly drunk and could not have been aware that they were in the road. They both said in court that they had thought they fell out of a moving truck.

I was acquitted.

Before I left the court the prosecutor said to me in my lawyer's presence, 'Let me give you some advice. Whenever someone comes to meet you with bright lights on, keep your eyes fixed on your side of the bonnet. Fix your eyes there so that you are aware of everything that may be in front of you. Never shift your eyes to the other driver's lights so that they blind you... Your right eye will be aware of his lights, but both eyes must stay on your side...'

That's what the white prosecutor said. I say 'white' deliberately so as to make my point. I seldom take seriously what a white man says to me,especially if I don't know him. I have grown up to think of white people generally as people who teach us, who give us orders, instructions, who issue threats and warnings, who always want us to tell them where we've been, why we stayed so long in the toilet... I have grown to resent this, and so I easily dismiss their words and go my own way.

But this white prosecutor's words have stayed with me for twenty-five years. Because his caution has taken on a deeper meaning. It applies to so much else that we experience in every walk of life. No matter how much other people have tried to take me off the course I have set for myself to do work that benefits both myself and other people, I have fixed my mind on my goal, on the truth as I see it. But I must have made dead sure that it is also the truth as the majority of our people see it. I think of people who try to pull me away from my purpose to achieve great things as that driver who blinded me with his bright lights. That unforgettable night I made the mistake of looking into the bright lights of another car.

When I fix my mind on what I want to achieve, I am able to ignore the howlings, the jeers, the destructive tauntings and criticisms of other people. I have learned that all you need is faith in the rightness of your words and actions. It has been for me a lesson for all seasons — a lesson for all time.

UPBEAT GOES TO ALEXANDRA

Alexandra is a township north of Johannesburg. It has a population of about 50 000 people. Alexandra was started 77 years ago. Blacks and Coloured could own land in the township. Alexandra grew into a strong, united community — a township with soul.

In the 1950's the government started to break up the township. All the people who were unemployed, or were new in the area were endorsed out of Alexandra.

In 1962 the government decided to do away with all family houses in Alexandra. They planned to build single-sex hostels. These would hold 20 000 people — workers from the white suburbs and factories nearby.

In the next ten years half the population of Alexandra were moved. People who owned houses were told to sell and go — or start paying rent.

Many families were broken up. Men and women had to live separately in the hostels. Children were sent to relatives in rural areas. Some stayed with other township families. In 1978 a local committee was set up under Rev. Sam Buti. The Alexandra Liaison Committee campaigned to keep the township the way it was. The Liaison Committee was formally recognised by the government.

In May 1979 the plans for Alexandra were changed again. The government said that families would not have to move. The township was for anyone with urban rights. Those whose passes were not in order would have to go.

In the last two years there has been a lot of interest in 'developing' Alexandra. WRAB has plans to build thousands of flats and houses in the next ten years. The houses will be sold under the 99-year leasehold scheme. There has been talk of building shopping centres and a giant sports stadium. Alexandra is to become a model township.

But plans for Alexandra have not gone very far. The government have not provided enough funds for the housing scheme. And so far only nine of the new houses have been built...

On the left the old Alex on the right new houses being built.

'It's a beautiful place, Alexandra. I wouldn't like to live in any other place. Forgetting the political issues, and other things — Alex is so welcoming'.

This was said by a young woman who lives in a hostel in Alexandra. UPBEAT spoke to her and to members of an arts group in Alexandra. The group is called Khauleza.

Khauleza members talked about their township and the way they see its future. They spoke about their group and the work it does.

KHAULEZA

'Khauleza is an art school. We do all kinds of artistic work — poetry, painting, music, acting and photography. There is also a research and information unit which finds information that people need to write their stories.

'We want to expose the realities of our society through our art. Our culture of resistance. Through our poetry we can mobilise our community. Our only concern at the moment is our community. We can make them aware that if they want to do anything — they can do it. Even though chances and privelege are not within their grasp, they can do anything they want to.

'We want to make films that show people our own history — not the kind of history that we are being taught at school.'

'Our films will counter those that are made by those people who own capital. By having capital at their disposal, they can use the media to actually spread their propaganda. Because the way they portray us in those black films — its wrong.'

'We have a lot of members — but they don't always come. Our main problem is finance, we can't get all our projects off the ground. We find ourselves concentrating on one thing at a time. The poetry and theatre groups are more developed than the others — they don't take much money to run.'

'We thought that we should raise money from our community — because it is a community project. But not many members of our community have money.'

'You see we can't accept money from just anyone. If we go to a big company for money, they will use us to promote their business. We would have to advertise, and show the world that they have donated money to Khauleza. In a way they'll be saving their guilty consience. They know what they are paying their workers — who are, of course our fathers.'

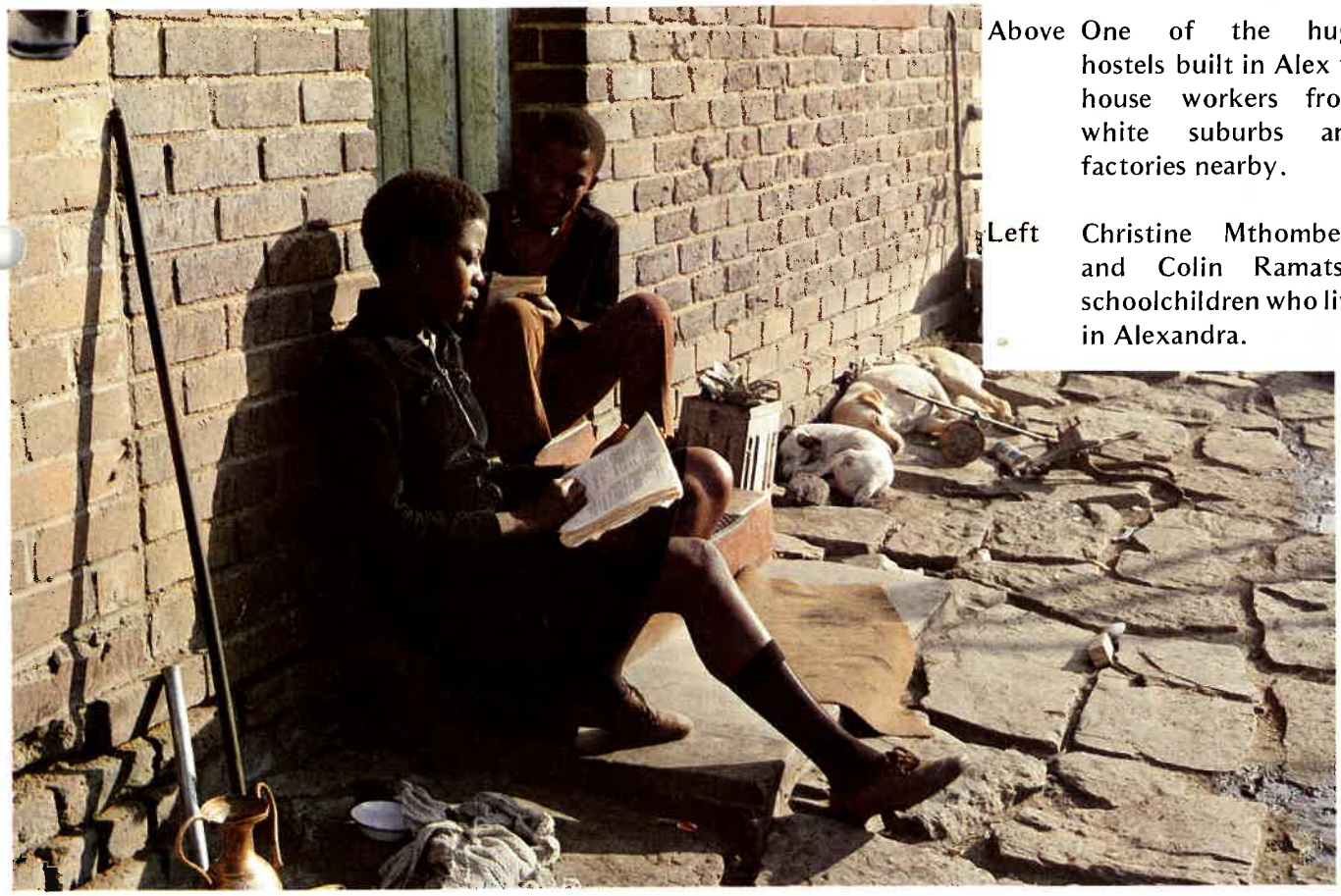
ON SCHOOLING

'The first problem that's facing our schools is the shortage of teachers. The teachers cannot cope. The teacher must teach many classes in different subjects. A teacher will be teaching Afrikaans in one class, and biology and history in another. Teachers do not have the time to prepare their lessons. Often they are not qualified. A teacher with a matric is teaching a class of matrics. Some teachers just read from the text books.'

'Schools are overcrowded — there's only one high school. Some students are forced to travel to Tembisa and Soweto for their schooling. My class has 56 students. You find the teachers concentrating on the students who learn fast. They leave the rest. A lot of students fail and leave school.'

'Another thing, the schools lack facilities. That building is rat-infested — big rats run under your feet in class. And in winter its colder in the classroom than it is outside.'

'Imagine a matric class doing science, there's no laboratory, no lights. Physical science is a practical subject, but you have to memorise all those things — what a test tube looks like. The exam paper tells you to draw a test tube, and I've never even seen one.'



Above One of the huge hostels built in Alex to house workers from white suburbs and factories nearby.

Left Christine Mthombeni and Colin Ramatsie schoolchildren who live in Alexandra.

'Our education is not meant to teach a person to know, or to do — but to memorise. Teachers actually discourage students. They take students as people who are empty, who know nothing. For example in a history class where the student has more knowledge than the teacher. When that student asks a question the teacher says 'no, that's politics."

'This year we went to negotiate for an SRC at school. We told them that the monitors and the prefects only represent the office, not the students. There's only one-way traffic. The prefects and the monitors take instruction from the office and give them to the students. We want two way traffic between the office and the students.'

THE FUTURE OF ALEXANDRA

'This idea of making Alex a middle-class suburb, its just stealing people from the general problems of the black community. Its like stealing Alexandra from Soweto.'

'They're building houses for first-class people. People think it would be better to demolish only the really bad houses, and leave the rest. But Sam Buti is always telling everyone that he's not building a township — he's building a city. I don't believe that Alexandra is saved anyway. As long as there is the same situation in this country. Alexandra will only be saved if the whole country has been saved.'

'If you say you will take my leg off, and then you don't have the courage to do it — you will say that you have saved my leg. Then as soon as I accept that you saved my leg, I will accept you, and you can bully me around.'

'I don't believe we were saved in any way. There is a long waiting list for houses in Soweto and in Tembisa. Where were they going to take us? I think that the government realised that they could not solve their housing problem. So they left Alexandra.'

'Now if they were serious about developing Alexandra, then they would set aside a specific amount of funds. But the last budget shows that the government sees the army as more important than housing.'

'People will never be able to afford those luxury houses anyway. Evictions would be the order of the day. Even now when the rents are quite low, there are som people who can't pay the rent. So how could they afford a house for R60 a month?'

'The people who can afford to go and buy those houses will not sympathise with those who cannot afford to. The communtiy will be divided into rich and poor. Presently there are those who are rich. But you can't pinpoint them because of the structure of the township. You don't see beautiful mansions and such things.'

'But in the future it is going to show clearly. The rich will be living in posh houses. And there will be no untiy in our children playing in the street together. The children of the rich will despise those who live in flats. Now they all play together, and there is communal spirit. But it is being destroyed by 'total strategy' as we see it in Alex.'

'The problem is that many people don't want to live in the present conditions. Think of a family of ten who live in one room. They are really looking forward to owning those houses.'

'Its unfortunate. We've been presented with the things we need most. But the purpose of such representations? It stinks!'

HOW IT WORKS — A TELEPHONE

When you make a telephone call, you are using the first method that man discovered of turning sounds into electrical signals and back again. Alexander Bell, an American, made this discovery over 100 years ago. Our telephones today are very much like the one he invented. As you can see from the picture, a telephone consists of a TRANSMITTER and a RECEIVER. The transmitter, or mouthpiece, is the part you speak into. It is a very simple kind of microphone. The receiver, or ear piece, is the part you listen to. It is a simple kind of loudspeaker. Now look below at the picture and read how the transmitter and the receiver work.

THE TRANSMITTER

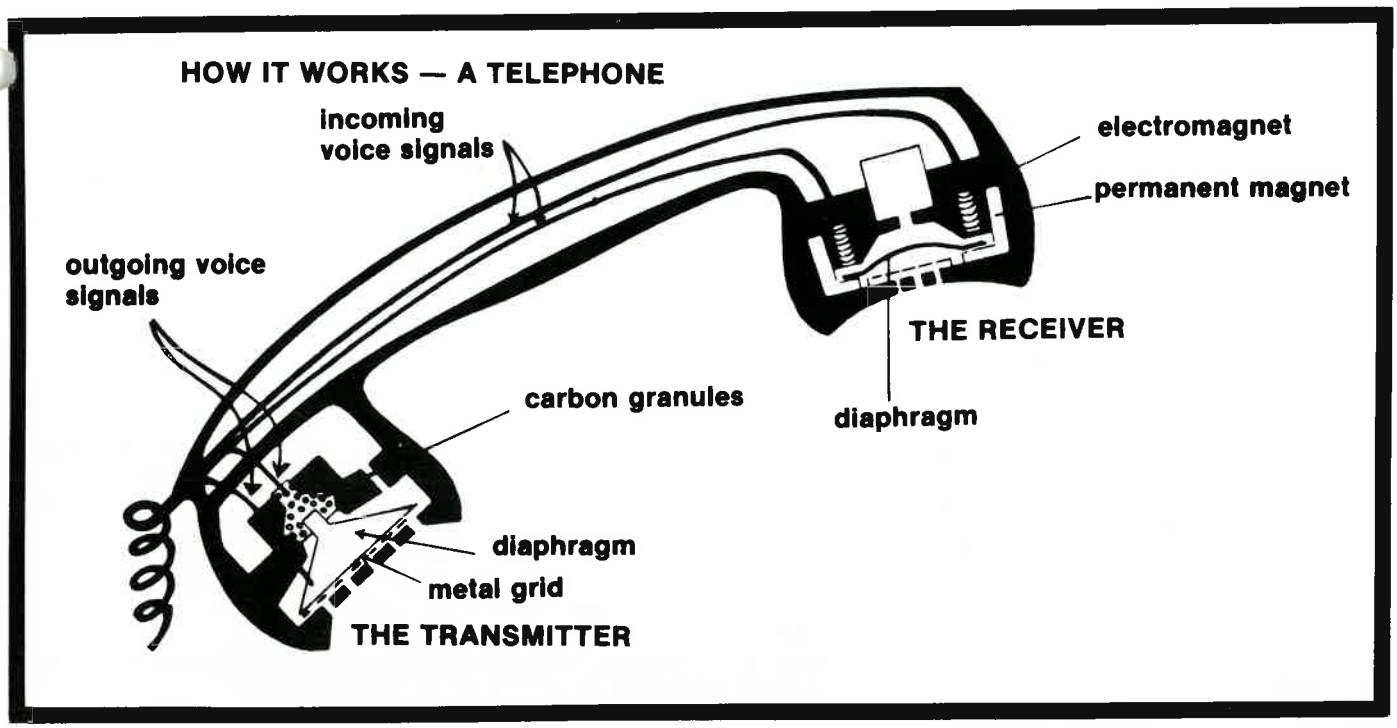
The transmitter is shaped like a cup to catch all your voice vibrations. Inside the transmitter in the picture you can see a little box containing carbon granules. This is joined to a thin metal disc called the diaphragm.

When you speak into the transmitter your voice vibrations cause the air to vibrate. These air vibrations go into the transmitter through the metal grid and cause the diaphragm to vibrate. This makes the end of the little box move in and out very fast — one vibration for every vibration of your voice. Each time the end of the box is pushed the carbon granules are pushed together, and each time the end of the box is pushed out, the granules are loosely packed again.

As soon as you pick up your telephone to call your friend, electricity flows through the telephone wires from the Telephone Exchange. It must flow through the carbon granules before it goes back. When the carbon granules are squeezed together the electricity flows well but when they are loosely packed the electricity flows weakly. In other words, your voice vibrations cause changes in the flow of electricity of electrical vibrations. These electrical vibrations travel along the telephone lines back to the Exchange, where they are sent on to your friend's telephone. Inside the receiver the electrical vibrations are changed back into sound. Look at the picture of the receiver. You will see the receiver contains a permanent magnet and an electromagnet. Between the ends of the electromagnet there is a metal disc called a diaphragm. When electricity flows into the receiver it magnetises the electromagnet. Each time this happens the electromagnet pulls the diaphragm towards it. Remember that the receiver is getting strong and weak flows of electricity in the form of vibrations. These electrical vibration cause the diaphragm to vibrate. As the diaphragm vibrates it makes the air next to it vibrate. Vibrating air causes sound and you hear your friend's voice.

WARNING

Remember never to use the telephone during a thunderstorm. If lightning strikes the telephone wires a huge voltage of electricity can be sent through to your telephone. If you are holding the telephone you will get a very bad electric shock. You could even die.



HOW THINGS STARTED

PENICILLIN

The First Antibiotic

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a group of moulds that stop the growth of bacteria

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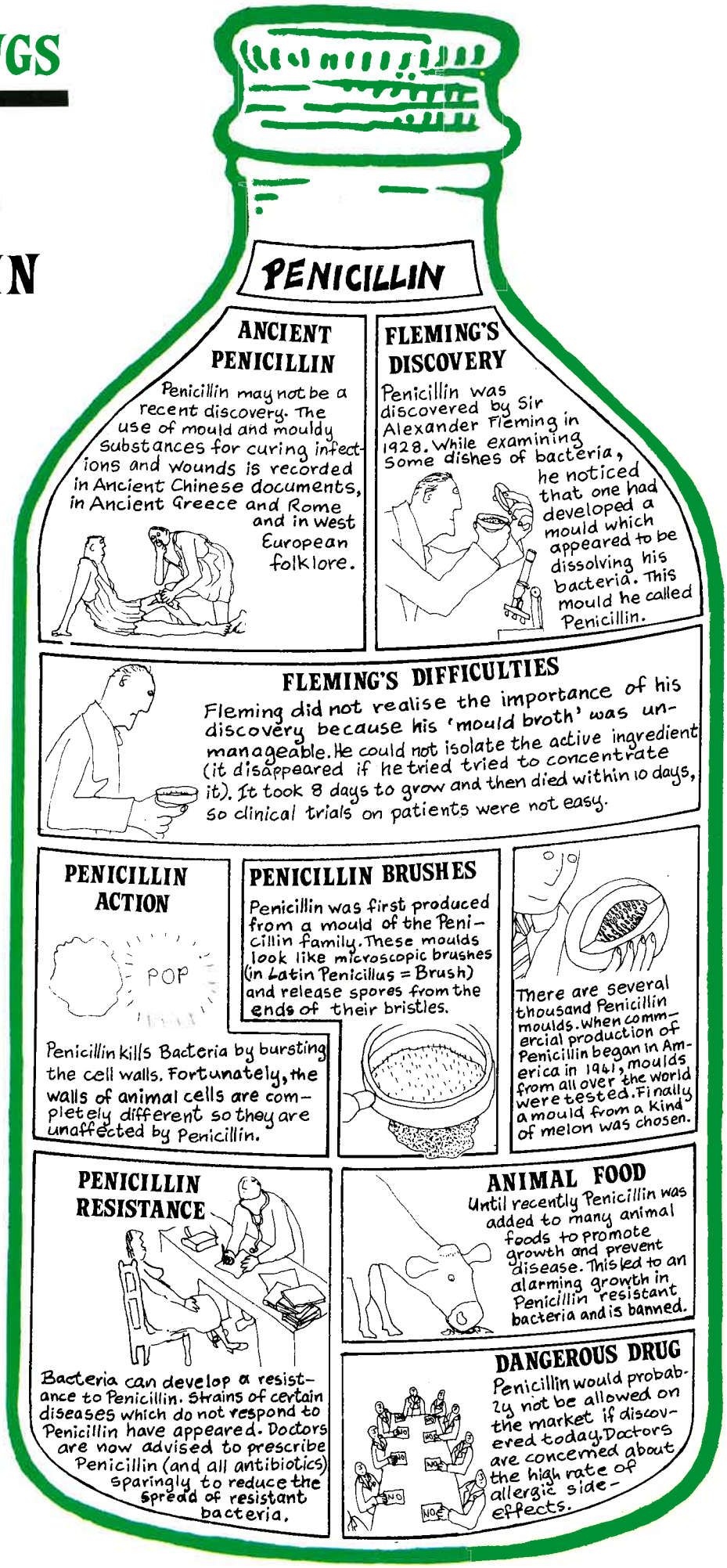


BOOK

REVIEWS

NO SWEETNESS HERE

Ama Ata Aidoo

'No Sweetness Here' is a book of short stories by Ama Ata Aidoo.

Aidoo writes about the people in her country, Ghana. Many of the stories are about young people — village children, students, and workers in the cities.

'Everything counts' is about a young girl who returns to Ghana after studying in a foreign country. Her friends are always telling her 'Not to struggle to look like white girls....above all, not to wear the wig.'

She argues with them — a wig is not a matter of great importance. They say 'it means we have no confidence in ourselves.' Eventually she stops wearing the wig.

When she returns to Ghana she notices that everyone is wearing wigs. In their struggle to look like the white girls they even start using skin lighteners. She says, 'It looked as though a terrible plague was sweeping through the land. A plague that made funny patchworks of faces and necks.'

Now she sees the truth in her friends' saying. Even her family has changed. When she plans to visit them, they say 'What are you bringing home, Sissie? We hope its not one of those little coconut shells with two doors heh? '

She thinks 'How could she tell them that cars and fridges are ropes with which we hang ourselves.'

The story ends with a beauty contest — where each girl tries to be whiter than the next. When she sees the winner — a girl with light skin and straight hair — she goes home and weeps for her people.

Other stories tell of the lives of people in the country. They live slowly, by traditional values. 'The late bud' is about a child, Yaaba who rebels against these values. She is always told 'The good child who willingly goes on errands eats the food of peace.' But she won't go on errands — and she doesn't get nearly as many treats as her obedient sister. At the end of the story Yaaba reforms and touches her mother's heart.

In 'Certain winds from the South' we see how rural families are broken by things that they cannot control. Hawa has just had her first baby, and her husband leaves the village to look for work in the South. He tells Hawa's mother. 'What will be the use in my staying here and watching them starve? You yourself know that all the cola went bad, and even if they had not, with trade as it is, how much money do you think I would have got from them?'

Hawa's mother remembers how she lost her own husband to the South. He died fighting for the English in the First World War. She did not even collect the government pension because she says, 'It was him I wanted, not his body turned gold.'

Some stories describe the villagers first contact with city life. A man goes to Accra — the capital of Ghana for the first time. He says, 'Each time I tried to raise my eyes, I was dizzy from the number of cars which were passing.' He is searching for his little sister who ran away from the village years ago. He finds her in a nightclub, 'Her lips with that red paint looked like a fresh wound.' In the big city she had become a prostitute. At the end of the story he says to his family 'Any kind of work is work....so do not weep. She will come home this Christmas.'

In a story called 'The message' old Esi Amfoa receives bad news about her only granddaughter. The granddaughter was 'opened up' and her baby removed in a hospital in the city.

Esi Amfoa and the villagers are sure she is dead. Esi Amfoa says, 'If you are always standing on the brink of death....with a stomach that is whole, then how would she do, whose stomach is open to the winds?'

The old lady makes the long journey to the city. In the hospital she is scorned by the smart city nurses. The doctor thinks to himself, 'Such a cassava stick....but maybe I will break my toe if I kicked at her buttocks.'

Esi Amfoa discovers the grand daughter alive and well — nursing twins that were born by Caesarian section!

'Two sisters' is about a typist, Mercy, who is just like the girls in the beauty contest of the other story.

Mercy always wears the smartest clothes. She wants a life of luxury. But a typist's wages are not enough.

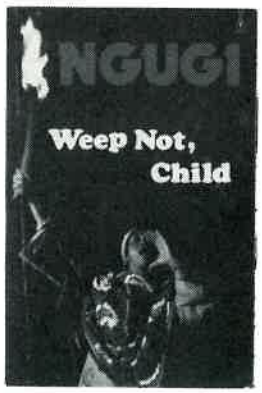
The way Mercy solves her problem shocks her sister Connie. Mercy starts going out with a government minister. He buys Mercy clothes — and drives her around in his smart car. Mensar Arthur is not only old and rich — but he is married!

Connie worries about her sister. But Connie's husband says, 'Every morning her friends, who don't earn any more than she does, wear new dresses, shoes, wigs and what-have-you to work. What would you have her do?'

Connie is pleased when there is a coup in Ghana — and Mensar Arthur gets put in jail. She thinks that Mercy's reputation is saved. The new government will not have corrupt old men in it.

But in no time Mercy is wearing new clothes. Now her boyfriend is Captain Ashley, of the new military government. And as for Connie, 'Connie just sits there with her mouth open that wide....'

In these stories Ama Ata Aidoo speaks with love about the village people. But she is critical of some traditional customs which harm people. Aidoo is also sympathetic to the young people in the cities who want Ghana to be a better country for everyone. She is critical of the rich, and the corrupt who only want to make their own lives happy.



WEEP NOT CHILD

Ngugi wa Thiong'o

'Ngoroge had always been a dreamer and a visionary who consoled himself, faced by the difficulties of the moment, by a look at a better day to come.'

And in that better day Ngoroge would be an educated man. He would study abroad and return to Kenya with his knowledge. He would have enough money to help his family. Perhaps he would even marry Mwihaki, the daughter of the richest black farmer in the area.

But Ngoroge's dream of the future would not come true.

'Weep not, child' is the story of Ngoroge's life — from a young village boy to manhood. He is the best student in the village and, although his family are poor, he manages to stay at school. He works hard and wins a scholarship to high school. His family are proud of him.

As Ngoroge grows older, he realises that all is not well in his country. One night he hears his father, Ngotho, talk about land. He tells how the best land was taken by white settlers. Ngotho now works on that same land for the white farmer, Harlands.

An old prophecy says that the white will give back the land one day. Ngotho is still waiting for this prophecy to come true.

Ngoroge's brother, Boro, listens to this story with 'a growing anger'. How could these people have let the white man occupy the land without acting? And what was all this superstitious belief in a prophecy?'

Boro is bitter. He no longer respects his father. Boro decides that night that he will fight to get the land back.

Many of Ngugi's books are about the peasants of Kenya and their struggle for land and freedom. The situation he describes in the beginning of 'Weep not, child' is the background to the Mau-Mau rebellion in the 1950's.

In 1952 a group of men under Dedan Kimathi formed fighting bands in the forests of Kenya. They were determined to win back the land from the British settlers.

The Mau-Mau attacked white farms and chiefs who helped the British government in Kenya. They had much support from the people in their villages.

The British army took strong action against the Mau-Mau. They arrested and tortured people they thought supported the fighters. Thousands of village people were murdered. The British often blamed these murders on the Mau-Mau.

The Mau-Mau rebellion continued for four years. Eventually Dedan Kimathi was captured and the Mau-Mau were finally defeated.

In 'Weep not, child' Ngugi shows how the Mau-Mau rebellion affected young Ngoroge, his family and the village.

In the characters of this book Ngugi describes the different sorts of people involved in the Mau-Mau rebellion.

* The old man, Ngotho, who is waiting for a prophecy to come true.
* The young boy, Ngoroge, who believes that his education will solve his family's problems.
* The brother, Boro, who wants to fight for the land and freedom of his people.
* The white farmer, Harlands, who helps the British stop the Mau-Mau uprising.
* The rich black farmer, Jacobo, who works with Harlands and the British army.

As the story moves on, Ngoroge's family becomes more and more involved in the rebellion. The family starts to fall apart. Boro leaves the village to join the forest fighters. Two other brothers are arrested.

When Jacobo is killed, Ngoroge's father confesses to the crime. Ngoroge is taken from school and tortured. The father, Ngotho, is brutally beaten and castrated. Later he dies.

At the end of the story Ngoroge is forced to leave school. He has to work to support his mother. His dream of education is finally shattered. One night Ngoroge tries to hang himself. His mother stops him. But he returns home a broken man.

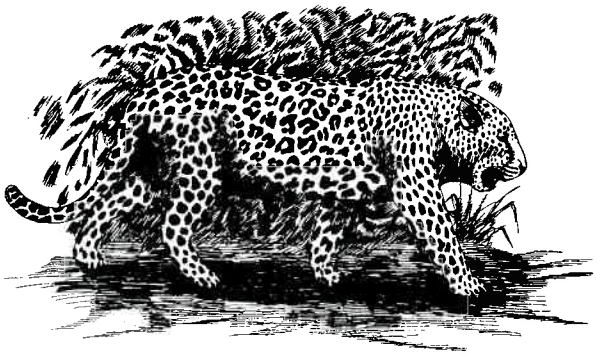
'Ngoroge had now lost faith in all the things he had earlier believed in, like wealth, power, education and religion.'

This story has a message for people today. Ngugi wants us to see that education and wealth alone cannot solve the problems of village people. The story shows how hard it is for Ngoroge — the best student — to get that education.

In the story Ngoroge's faith in these things cuts him off from village life and the Mau-Mau rebellion. Ngugi says that Ngoroge 'did not know that this faith in the future could be a form of escape from the reality of the present'.

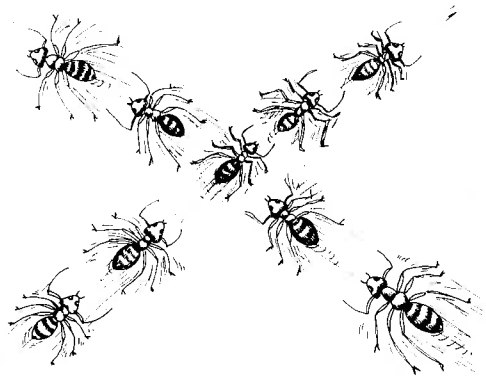
Willie Wordworm YOUR DICTIONARY PAGE

On the Willie Wordworm page you will always find words which are fun to learn and which you can use. Here are some words which come out of the articles in this issue of UPBEAT. In the brackets after the word you will find the name of the article where the word appears.

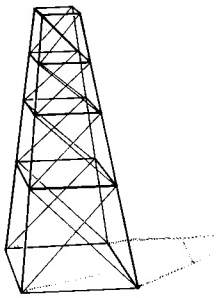


Camouflage To make it difficult to see something by changing its appearance (Ecology)

Trail A track, such as footprints, left by a person or animal (Short Story)

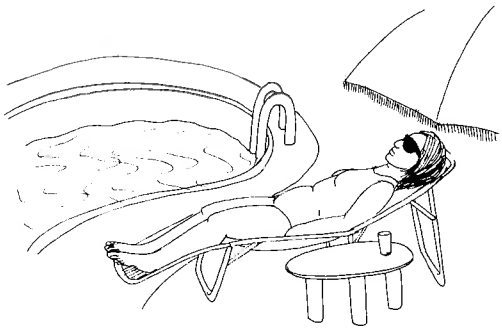


Intersection The point where two lines cross (short story)

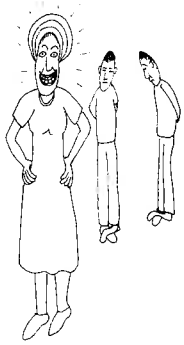


Structure A building that is made of many parts (Ecology)

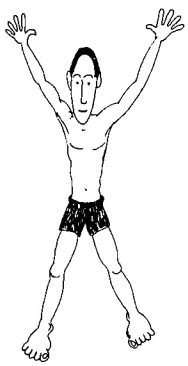
Majority The greater number or greater part



Luxury Great comfort



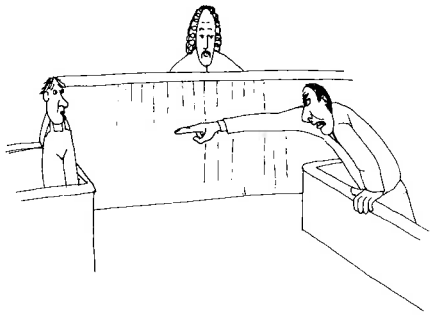
Confidence A feeling of being sure of oneself



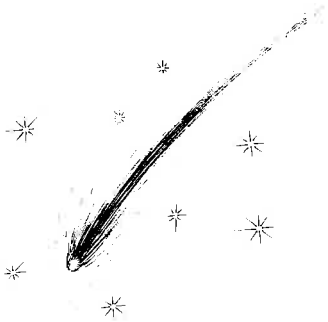
Spread-Eagled A position in which the arms and legs are stretched out (Short Story)

Willie Wordworm

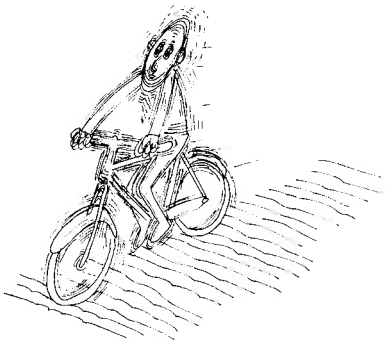
Corruption Dishonestly using one's position to make money (Book Review)



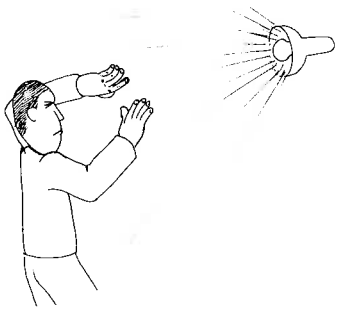
Prosecutor The person who presents the charges against another in a court of law (Short Story)



Meteor A shooting star (Short Story)

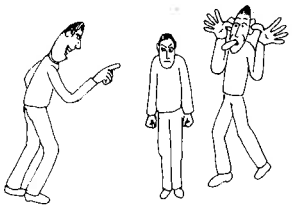


Vibrate To shake or tremble (How it works)

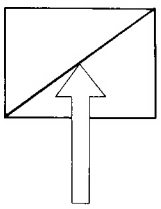


Glare A hard unpleasant effect given by a strong light (Astronomy)

Sympathy Having a kindly feeling for someone who is in trouble (Book Review)



Taunting Making fun of a person in an unkind way (Book Review)



Diagonal The line that joins the corners of a four-sided figure (How to play Chess)

HOW TO PLAY chess

PART 2

In the last issue of UPBEAT we looked at what was needed to play the game of chess. We also looked at the names of the chess pieces and the different moves they make. In this article we will show you how to start your first game of chess.

Before we begin let us find out what is the aim of the game of chess.

THE AIM OF THE GAME

In chess each player tries to capture his opponent's king. If you do this you win the game. When the game starts the kings are well protected by the other pieces. As you begin to move your pieces to try to capture your opponent's king, you start to reduce the amount of protection your king has.

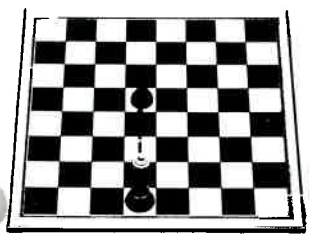
When the king is captured we say that he is CHECKMATED. This means that he finds himself blocked in a position from which he cannot move without being captured.

HOW PIECES MOVE AND CAPTURE

THE QUEENS

The two Queens are the most powerful pieces on the board. The Queen can capture any piece on the square at the end of her move and she then remains on that square until she moves again (Figure 1 and 2).

1



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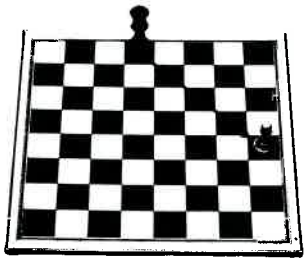


1 The White Queen from her starting position can take the Black Pawn in one move as shown by the arrow. Here she moves up the Queen file.

2 Black Queen can take White Pawn in one move as shown by the arrow. Here she moves across a diagonal.

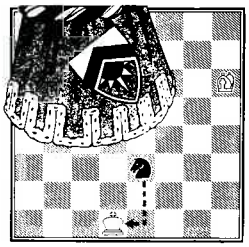
THE KING

The Kings can move forwards, backwards, to the side or diagonally but must move only one square at a time.

Your King can capture any piece of your opponent's which is on the square next to him. The King can do this as long as he does not move into a position in which he would be captured.

Not that there are times when the King must move. When the King is being attacked and could be captured in the next move, he must either move out of the attack or one of his other pieces must rescue him. The King can be rescued by calling to his assistance one of his own pieces to capture the attacking piece (as in Figure 3 and 4) or the King can place one of his pieces between himself and his attacker (as in Figure 5 and 6).

3



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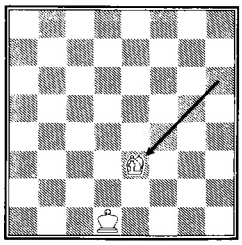
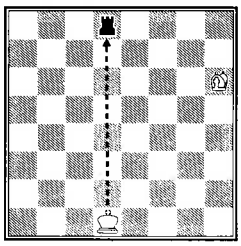


3 Here the White King is in Check from the Black Knight White solves the problem in Fig. 4.

4 The King may call one of his own pieces to his aid to capture the attacker.

5



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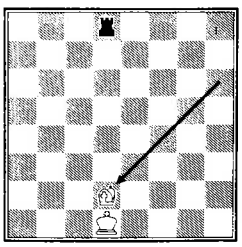


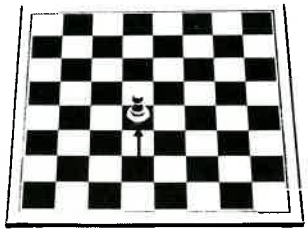
5 White King is in Check from Black Rook. Fig. 6 shows the move that gets White out of trouble.

6 The White King gets out of Check by putting the White Bishop between Black Rook and himself.

PAWNS

Each Pawn is moved in the same way — one square forward in its own row. However, if you wish you can move your pawn two squares forward on your first move (Fig 7). A Pawn cannot move forward if there is a piece immediately in front of it (Fig 8). In this case it is blocked and cannot be moved again until the path is clear. Pawns capture diagonally (Fig 9 and 10).

7



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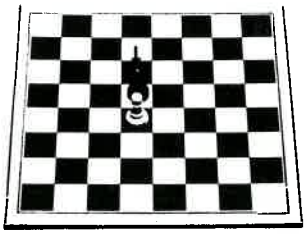
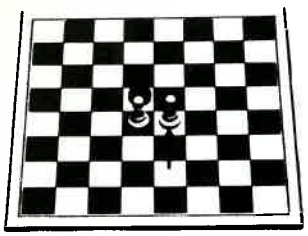


7 White opens the game by moving his Queen Pawn two squares forward.

8 Black replies by making the same move and blocks the advance of White's Pawn.

9



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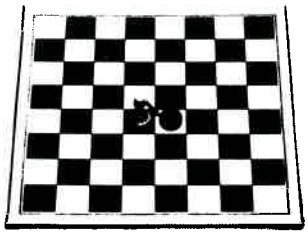
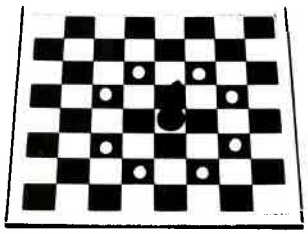


9 White now moves his King Pawn two squares forward and...

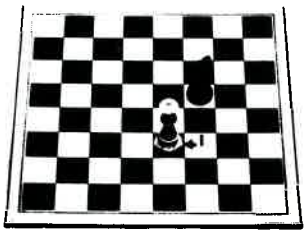
10 Black takes White's King Pawn because Pawns capture diagonally. If White had moved his King Pawn only one square he would not have lost it!

KNIGHTS
The Knight has an L shaped move — two squares in one direction and then one square to the side. The Knight captures an opponent's piece on the square it lands on (see Figures 11 and 12).

11



12

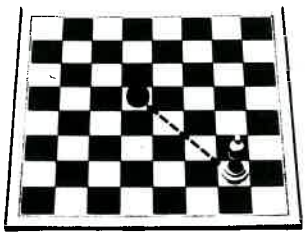


11 From this position the Black Knight can move to any one of the squares marked. If an opponent's piece is on any one of these squares it can be captured by the Black Knight.

12 It is Black's move. Two squares along and one across and he has captured White's Queen!

BISHOPS
A Bishop can move forwards or backwards, across any number of squares but always diagonally. A Bishop can capture any piece on the square he moves to (Figures 13 and 14).

13



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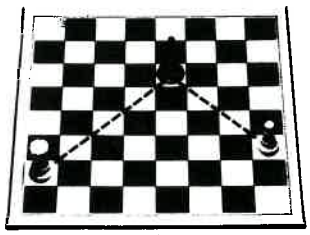
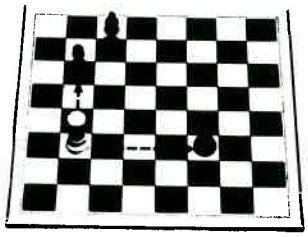


13 This White Bishop is about to capture the Black Pawn. He is moved across the diagonal shown by the arrow. He then remains on the square occupied by the Pawn until he is moved — or captured.

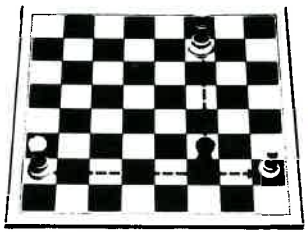
4 This Black Bishop can be moved across either of the diagonals indicated by the arrows. He can capture either the White Pawn or the White Rook. The Rook capture is the better move.

ROOKS
Rooks never move diagonally. They move in straight lines across any number of squares. They can also move backwards or forwards. The Rook can capture any piece on the straight line in which he moves (Figures 15 and 16).

15



16

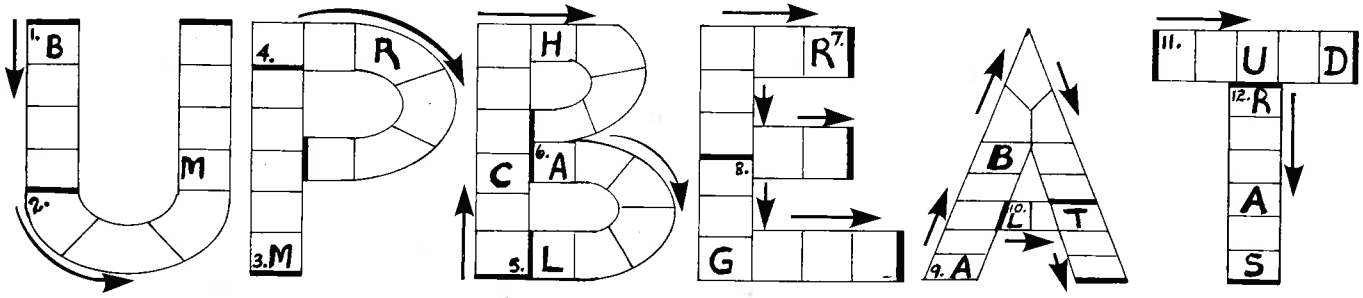


15 The White Rook can Capture either of the Black Pawns in one move. Which should he take? Note that one of the Black Pawns is guarded by a Bishop which could capture the White Rook!

16 It is Black's turn to move. He could capture the White Rook, the White Pawn or the White Queen.

You are now ready to try out your first game of chess. Remember that white always starts the game.

competition



Here is a competition for you to enter. 6 lucky winners will receive the book, 'Weep not Child' which is reviewed in this issue. The names of the winners will appear in Issue 9.

HOW TO ENTER

Answer the questions opposite.

You will find the answers in 'How it works' and 'How things started' in this issue.

Fill in your answers in the letters UPBEAT above. Fill in the letters of each word in the direction of the arrows. The beginning and end of each word is marked with a heavy line.

We've given you a bit of help by filling in some of the letters. Then copy your answers on to a postcard. We would like to know something about you so please include some information about yourself, like this:-

QUESTIONS

1. The name of the man who invented the telephone.
2. The name of the man who invented penicillin.
3. Penicillin was first produced on a commercial scale from the mould of one of these fruits.
4. Tiny granules of this are in a small box in the telephone transmitter.
5. The telephone transmitter is a simple kind of one of these.
6. For a long time penicillin was put into.....food to make them strong and healthy.
7. The name of the ear-piece of the telephone.
8. Inside the ear-piece of the telephone there is a permanent....
9. Penicillin is one of these types of medicines.
10. The name 'Penicillin' comes from a word of which language?
11. The telephone changes this into electricity.
12. Many years before Penicillin was discovered these people used moulds to treat infections.

My name:
My address:

My age:
My school:
My standard:
My interests and hobbies:

ANSWERS
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13.

Post your post cards to:- UPBEAT Issue 7 Competition P.O. Box 11350, Johannesburg, 2000.


No sweetness here
'Kwesi is handsome if ever I am transferred from this place I will kidnap him'.
Ei, Chicha, You should not say such things. The boy is not handsome really. 'Please, I know you're making fun of me But please promise you won't do it'
'O, Maami Ama don't cry you know I don't mean it'
What will happen to Kwesi? And will you succeed in keeping him.
I will struggle to keep him
If the elders hand him to Kodjo Fi I wouldn't refuse
You are a brave woman
Kwesi is back from school
'Mama, I am back!'
Kwesi can't you play with out putting sand into your hair
Shame your chicha is here
'Bye, bye, And remember if Kwesi gets his sums wrong, I will come to school to recieve his lashes if only you tell me'
'Yoo.'
IN THE COURT YARD PIECES OF COMMENTS FLOATED
The elders certainly have settled the case fairly
But it seemed as if Kodjo Fi had no strong proofs for his urgements
They both have been sensable if one can't live with a woman one might as well divorce her
I have come Maami Ama. And how are things
I am a divorced woman
CHICHA REMEMBERED THAT SHE HAD TO HURRY TO SCHOOL TO DISMISS THE CHILDREN
Where are children, funny their books are here. But Kwesi's books are not there?
WHAT HAS HAPPENED?
Kwesi ha been bitten b a snake!

PASSING BY THE OLD FOLKS

'Kudiimin-o chicha? how are you and your children?

'Kudiimin, Nana'. Iam well---they are well.'

Do you Know tomorrow I am getting a formal divorce?

'Oh!! no.'

'Yes, Iam. What am I going on like this for? Seven years is a long time to bear ill-usage from a man coupled with contempt and insults from his wives an his sisters and mother because I don't buy her expensive cloths on the market and I don't give her the best fish

Does she insult you too'

THE NEXT DAY WAS AHOBAADA A DAY OF REJOICING FOR EVERYONE AND A DAY FOR SETTLING OLD FAMILY QUARRELS

And a school break for kwesi and his classmates

Whilst Kwesi and his classmates are playing I will go and hear how the divorce proceed-ings fared for Maami Ama

AFTER THE DIVORCE, KODJO FI'S SISTERS WERE SAYING ABUSIVE REMARKS TO MAAMI AMA

She is a witch

'Oh that she is.'

Soon people were shouting at each other. And the quarrel for custody of Kwesi began between Maami Ama's sisters and Kodjo Fi's sisters. Maami Ama told Kodjo Fi's sisters to go and get kwesi at school where he was.

'Oh! my only child!' cried Maami Ama

The chief messenger was sent out to summon the help of the medicine man in the next village, who was the best. But he failed to save Kwesi's life, and so the handsome Kwesi died.

Letter to UPBEAT readers

Hello folks!

When I saw the first issue of UPBEAT magazine I was literally thrilled. I sat on the edge of my chair from sheer excitement. I thought aloud, "Now here at last, at LONG last - we own a magazine we've been waiting for so long!" Oh so long! When I read the following issues, I became more and more convinced that UPBEAT is worth every effort, every cent, to keep it alive, to make it grow from strength to strength to strength, to make it take root in our lives, wherever we may be in this country.

What has there been for you to read in this country except comics, sometimes trashy sex magazines hidden away from parents and teachers? Here and there one meets a youngster holding a detective and mystery novels, and there are trashy ones. Better than nothing, you'll say. Fine. But there are more and still better novels we can read today. And now there is UPBEAT.

Why is UPBEAT so important to our lives? Let me list the main reasons:

1. It educates us about ourselves and about the rest of our continent, Africa, and the rest of the world.

2. It provides general information e.g. about war; sport and concern of the world in apartheid as we see it in South African sport; about our enviroment (ecology); space travel; energy, which touches every day of our lives; world cultures we may not be familiar with; about the common things we come into contact with like paper, magazines, and so on.

3. It entertains us with short stories, poetry, autobiography, interviews, passages from novels and other forms of writing. This kind of entertainment enriches our lives, that is why we like to read fiction, poetry and other kinds of writing that comes from the author's imagination.

We enjoy reading a story or play or poem or essay because it moves us. It moves us through powerful and beautiful words. Words are beautiful because they are more powerful and therefore affect us. And when they are powerful and beautiful, they live in our memory. Which is why we say good literature is memorable.

Over and above this, UPBEAT teases our own minds, so to speak, by leading us to realize that we can also create beautiful, powerful and memorable words about our own experiences. In this way we as readers can feel that we belong to UPBEAT

and it belongs to us. SACHED who produces the magazine, including its editor, is our friend. A true friend likes to see us grow in mind, body and spirit. But SACHED also needs our friendship, which also means our interest and attention, so that it may continue to give us good things that are food of the mind.

4. It also entertains us through fun and and games which include quizes, puzzles, cartoons, colourful and black-and-white illustrations.

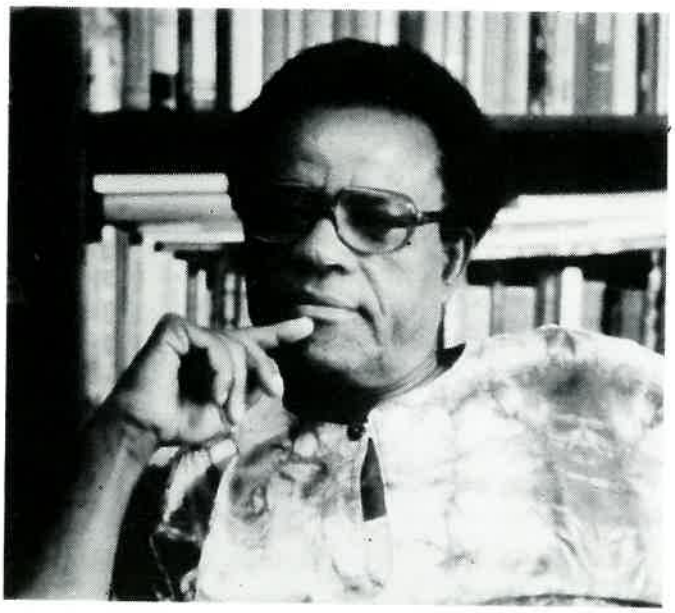
To go back to Point **1:** the education we experience in the classroom can never be enough. It is only when we apply class-room knowledge in real life, even when we have been through university, that we realize how much more we need to know, to learn, to educate ourselves.

Hence UPBEAT presents topics we study in school subjects in another form that will stimulate or excite our interest further. We may thus feel encouraged to continue to read more and more about such topics. I'm thinking of pages that contain knowledge about physical science, about human and plant geography, health science, and so on. Again, UPBEAT will help us to understand how these subjects are connected with one another, with real life as we experience it and as we hope to experience it.

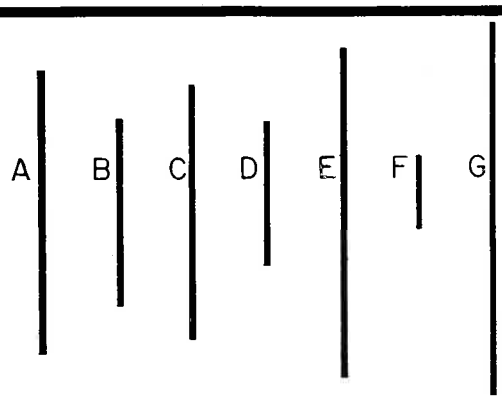
UPBEAT shows us that knowledge has no colour barriers, it is there for anybody to obtain, and no one in the world can take it away from us.

In all that I have listed, I see UPBEAT as a magazine rich with information and entertainment which should, if we are faithful readers, enrich our minds and hence our lives. We can, through this enrichment, grow to have faith in ourselves. We need this faith - and how! So here is UPBEAT. Take it. Let it be your constant companion, and let it enrich your lives and make you strong.

Yours faithfully
Es'kia Mphahlele.



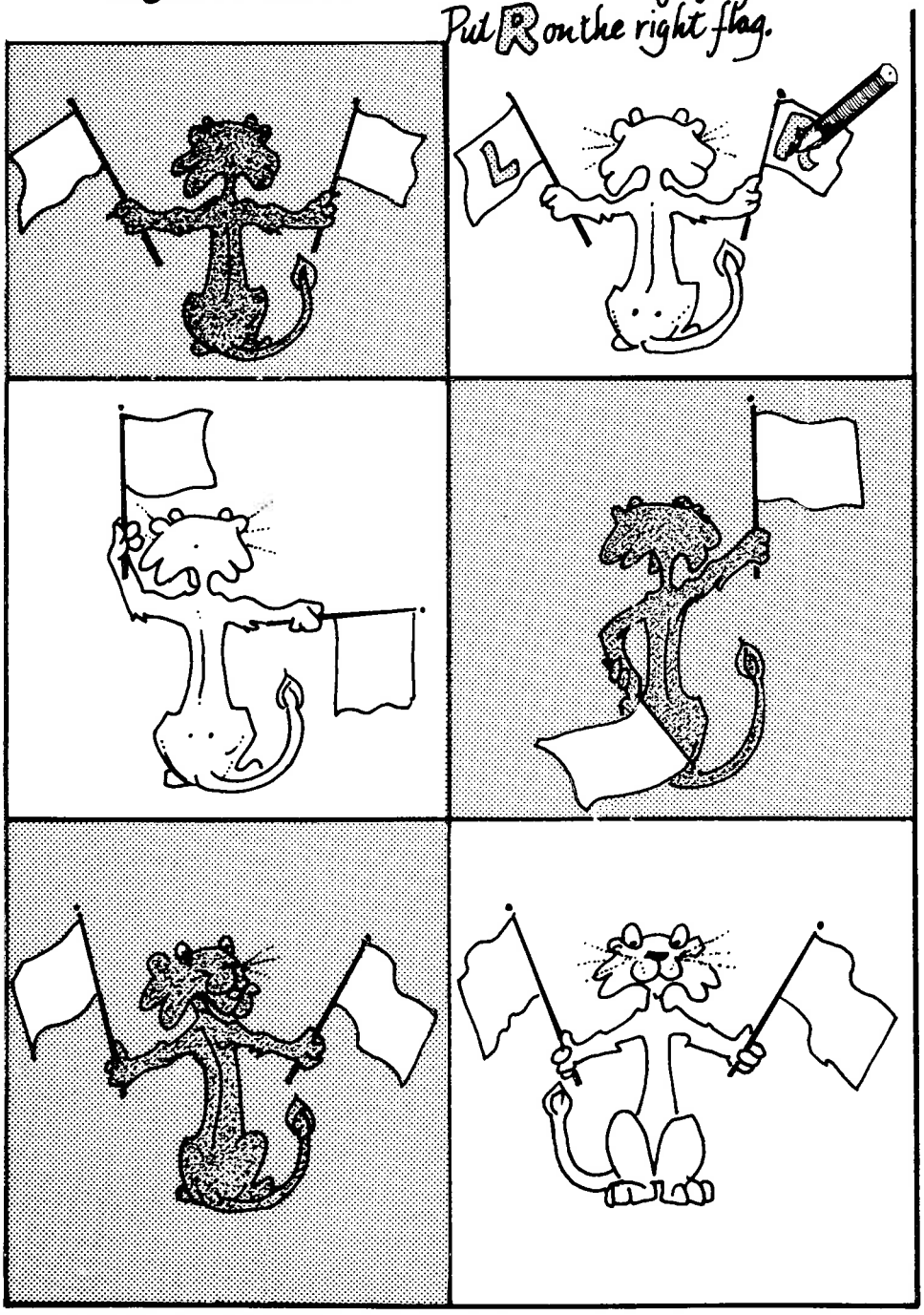
PUZZLE PAGE

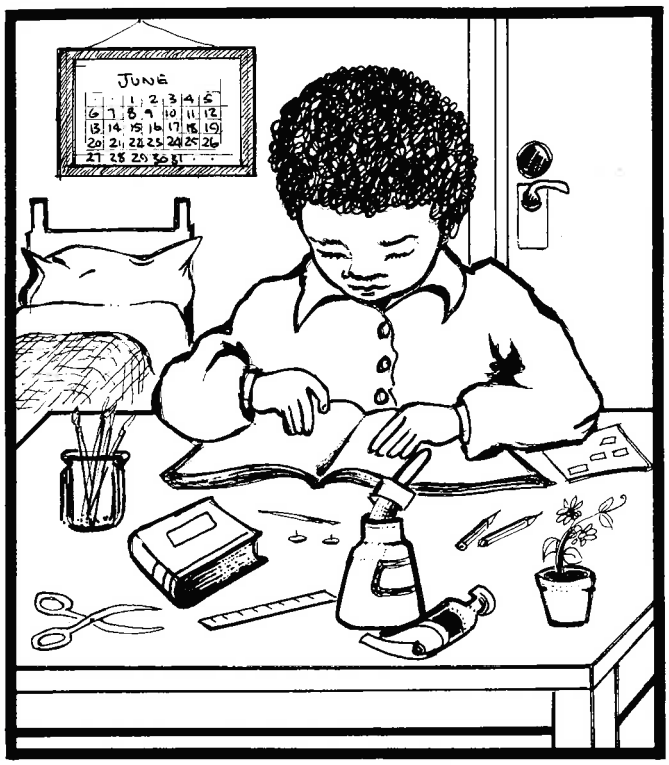


All of these lines are different lengths. Put them into order, from the longest to the shortest.

Right or Left?

Put L on the left flag.
Put R on the right flag.





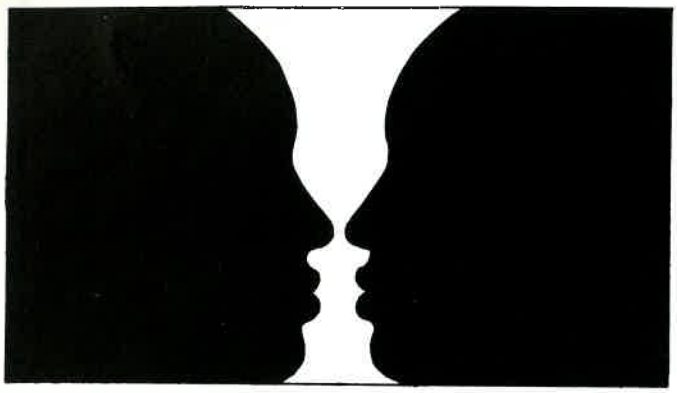
These two pictures may look the same, but there are 11 differences on the second picture. See if you can spot them.

Pick out, from the words in brackets, one word that has the same meaning as the given word:
rage (game, anger, fast)
famous (well-known, cross, lovely)
bright (shiny, eat, salty)
sorrow (joy, today, sadness)

Here are some clues for words. Each word starts with the letter 'b':
a small animal with wings and fur on its body;
to start something;
something you read from;
when you cut yourself you will....;
something to make a car or bicycle stop;
the opposite of after.

ANSWERS TO PUZZLES
LINES: G, E, A, C, B, D, F.
DIFFERENCES: There are different months on the calendars on the wall, the boy has only two buttons on his shirt, the pillow has flowers on it, there are only 3 brushes in the jar, there is an extra pencil on the table, the plant has an extra flower, there is a keyhole in the door, the lid is properly on the glue pot, the book has writing in it, there is an extra drawing pin and the book on the table is thinner. How many did you get?
CLUES: bat; begin; book; bleed; brake; before.
SAME MEANING: rage - anger
famous - well-known
bright - shiny
sorrow - sadness

YOU AND YOUR BODY



Look at the picture on this page. What do you see? Sometimes a candle — sometimes two faces.
Proper seeing is a complicated business. It depends on:

* two eyes which collect light from all the things around them. They turn the light into messages which they send to the brain.
* a brain in working order which makes sense of the messages from the eyes.

A blind person has to 'see' with his other senses — touch and hearing. The brain of a blind person learns to make up a picture of what is around him.

Some people have normal eyes — but they can't see normally. Their brains can't make sense of the messages the eyes send it. This is the cause of dyslexia or 'word blindness'. A dyslexic person may see the word 'dog' as 'god'. Many people never learn to read because they are dyslexic.

In this issue of UPBEAT we will look at the eye and how it sees. In the next issue we'll look at the work the brain does to make us see.

Diagram 1.

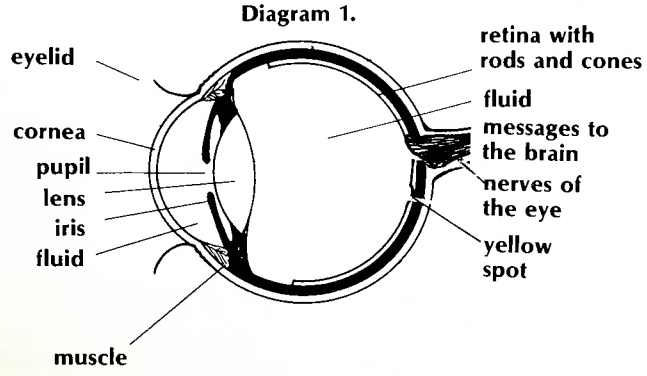


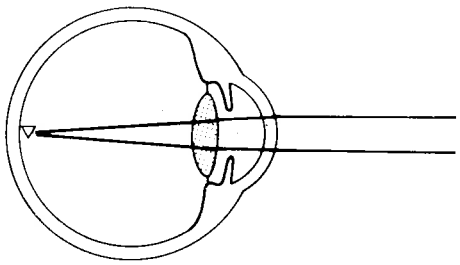
Diagram 1 shows an eye cut in half. Look for the lens and retina. These are the most important part of the eye.

The lens collects the light and focusses it on the back of the eye. It makes a sharp, clear image of what we are looking at.

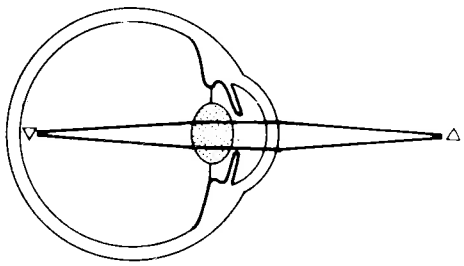
The lens changes its shape all the time. The lens is much fatter when we are looking at things that are near. It is thinner when we are looking at things that are far away. This means that everything we see is in focus on the back of the eye. Diagram 2 shows how this is done.

Diagram 2.

The lens changes shape to focus on objects near and far



A far object needs a thin lens.



A near object needs a fat lens.

The retina is at the back of the eye. The retina catches the image and turns it into messages or nerve impulses for the brain.

The retina is make up of cells which are sensitive to light. These cells are filled with a pigment which breaks down when light reaches it. When the pigment breaks down it gives off nerve impulses. These nerve impulses are sent down the eye nerve to the brain.

There are two kinds of light-sensitive cells in the retina:

* The rods — which see in dim light. They can't see colour. The rods work mainly at night.
* The cones — which see bright light and colour.

The rods and cones are arranged in the best way for seeing. Right in the middle of the retina there is a spot which is mainly cones. This is called the yellow spot. The cones in yellow spot help us see what is right in front of us very clearly.

Every eye has a blind spot. This is where the nerves of the eye leave the retina. Diagram 3 shows you how to find your blind spot.

The other parts of the eye in Diagram 1 all help the eye to do its work.

The EYELIDS and EYELASHES protect the eyeball

from damage. The eyeball is covered in a tough outer layer which protects it. This layer forms the white of the eye. In this layer, in front of the lens, there is a window which lets the light in. This window is called the CORNEA. The cornea is curved so it also helps to focus the light on the lens.

Between the cornea and the lens is a curtain called the IRIS. The iris has a hole in the middle called the pupil. The pupil lets the light into the eyeball. The iris can make the pupil bigger and smaller to let in more or less light. In dim light the iris makes the pupil very big to let in as much light as it can. On a bright day the pupil is small and helps cut out the glare. The iris is the coloured part of the eyeball.

There are two pockets of fluid in the eye — in front and behind the lens. The fluid in front of the lens feeds the lens and the cornea. The fluid behind the lens gives the eyeball its shape.

The eyeball has muscles which attach the eye to the head. The muscles work to make the eyeball more round. Special muscles hold the lens in place. These muscles make the lens thicker and thinner.

Diagram 3.

The blind spot.

How to find your blind spot. Shut your left eye. Look at the cross with your right eye move the magazine forwards and backwards. The dot will dissappear.

BLINDNESS

There are many causes of blindness. A person can go blind when any one of the following are badly damaged: cornea, lens, eye fluid, retina, eye nerves.

Lets look at some common causes of blindness.

CATARACTS

When the lens of the eye becomes clouded it causes cataract. The lens does not let in enough light for the retina to work. A bad cataract can only be cured by an operation. In this operation a doctor removes the lens from the eye. Sometimes an artificial lens is put into the eye. The person has to wear special spectacles to see properly.

GLAUCOMA

Glaucoma is when there is too much fluid in front of the eye lens. This fluid pushes the lens backwards. The pressure damages the retina and the eye nerves. Glaucoma can be cured by an operation, or by certain drugs. But if the eye nerves are badly damaged the person will never see again.

An old woman outside the eye hospital at Elim, Gazankulu. She is blind from trachoma.

TRACHOMA

Trachoma is the biggest cause of blindness in Africa.

Trachoma is very common in the Northern Transvaal. In some areas one quarter of the people have trachoma. Trachoma is caused by a germ (bacteria) which infects the eyelid. The eyes become red and watery. Small lumps grow on the back of the eyelids. The lumps eventually go away — but they leave bad scars. A person who gets trachoma once does not go blind. But if she gets it often then the eyelid becomes very scarred. The scars make the eyelid thick, and the eyelashes turn inwards. The scars and the eyelashes scratch the cornea. Eventually the cornea becomes too damaged to let light into the eye. The person becomes blind.Trachoma is very catching. A mother with trachoma can give it to her child by touching his eyes. The child can give it back to the mother in the same way. Young people do not usually go blind from trachoma. Older people go blind after they have had trachoma many times. Trachoma is quite easy to prevent. A mother with clean hands does not give trachoma to her child. But in most rural areas there is not enough water for washing. Every drop of clean water is used for cooking and drinking.

ECOLOGY.....ADAPTATION

We all talk about 'survival of the fittest', but what do we actually mean by it? It has nothing to do with 'fittest' as we usually think of it — that the person who jogs the most and does bodybuilding will survive the best! The fittest in the true sense are those creatures or plants that are best suited to the environment in which they live. But what sorts of things make anything suited to its environment?

There are very many different kinds of environments in the world. We can see that there is a great difference between the sea, a mountainside, a desert, the veld or a forest. And obviously the kinds of animals and plants found in these different areas will be completely different. But there is a lot more to an environment than this. The amount of sunlight, heat and rain in a place, the kind of rock and soil, wind and all sorts of other things combine to make an environment what it is. Within any particular environment only particular things can be found and nothing else.

Firstly only particular kinds of plants will grow there, then only the kinds of creatures that eat those kinds of plants will be there, then the creatures which feed on those particular animals will be there. And this can be different from one piece of land to another, even though the two areas may look the same to us. It can even be different from one side of a rock to the other because the two sides may get different amounts of light and heat.

Anything growing and living in a particular place is there because its own kind have been able to **adapt** successfully to that place. An adaptation is any change that a plant or creature makes to help it to live more successfully in its environment. These changes are passed on to the next generations and finally become permanent. If, for example, we take a whole lot of plants from one place that gets a lot of rain and plant them in a place that doesn't get very much rain, most of them will die. But a few won't. These plants have something that makes them able to adapt to living in a place with not much rain. The seeds that they pass on to the new plants will also have this, and eventually there will be very many plants that are perfectly adapted to living in that low-rainfall area.

Here is a perfect example of adaptation because of a change in the environment: In Britain in the last century there was a pale, kind of moth that used to live on the pale lichen on tree trunks. This way it could not be seen by its enemies and it survived well. Then came the Industrial Revolution when factories sprung up all over the countryside. The smoke from the factories coated trees with black soot, and now the pale moth was no longer hidden. Within a few years the moth had adapted, and its colouring was now dark so that it could still hide against the tree trunks.

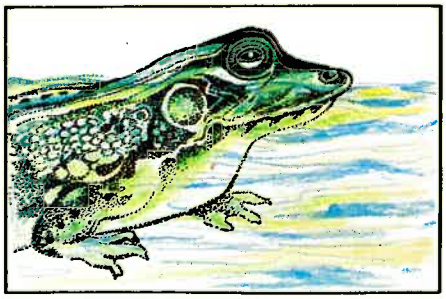
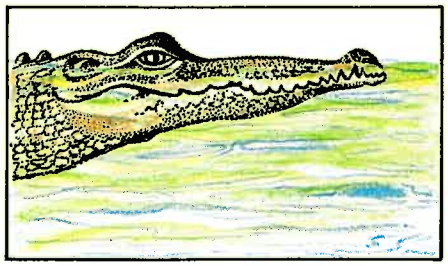
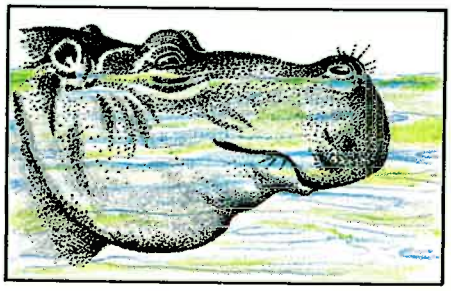
There are three different ways that creatures and plants adapt to their environment. The first way is in adaptation of **structure** — that is, an adaptation that can be seen in the body of the creature of plant. So we can tell by looking at the feet and bills of birds what kind of environment they live in — one that wades around in water and catches fish will have long toes, and long legs and a long bill.

Camouflage of all kinds is adaptation of structure. So the stripes of a zebra or tiger or the markings of an insect that looks like the plant that it lives on are adaptations that help it to survive better in its environment.

The second way that creatures can adapt is in adaptation of **physiology** — that is, changes of the body that can't be seen. For example, all living creatures need water to survive, but the kangaroo rat of the American desert can live its whole life without ever drinking a drop of water. It has adapted its body to survive without water, and it gets all the moisture that it needs from the dry seeds that it eats.

The third kind of adaptation is in **behaviour**. An example of this is a kind of fish called a **file-fish.** This fish is eaten by larger fish, so when any other fish is around, the filefish gets among the weeds and points its body upside-down and gently waves its fins. This way it looks like the weed around it and the other fish leave it alone.

Now any creature in any environment may use any or all of these ways of adapting to fit itself better to its environment. In this way it makes sure that it is best able to find its food, that it will not easily fall prey to other animals and that it best can find a mate and reproduce its kind. Because creatures are able to adapt successfully and fully to what the environment demands of them, we find a strange thing happening. This is that creatures living in the same environment often look alike even though they are not in any way related. For example the frogs, crocodile and hippo-potamus all live in water but breathe air. So they all have nostrils and eyes that stick up out

of the water so that they can breathe and see what is going on while their bodies remain under the water. This is for all of them an adaptation to the environment, but the frog is an amphibian, the crocodile is a reptile and the hippopotamus is a mammal.

Plants and animals that are found in totally different parts of the world but that live in similar environments are often very similar in very many ways. This development of similar adaptations in unrelated kinds of plants and animals is called **convergence.** And obviously it means that a particular adaptation is successful and really works in the environment. But now we might think that if an environment has many creatures successfully adapted to it then each one of those creatures has less chance of survival because there are so many others trying to live off the same piece of land and trying to get to the same supply of food.

This is in fact not true. Even though the adaptations might be the same, **each creature becomes a specialist at getting what it really needs from the environment,** which will be slightly different from what every other creature needs. So although the frog, the crocodile and the hippo all have similar adaptations, they all demand different things from the environment. The frog catches insects, the crocodile catches large prey and the hippo eats plants.

So they manage to live together very well in the same environment.

Now what about us? What kinds of adaptations do people make to their environments? We can certainly see examples of adaptation of structure and physiology in people. For example in skin colouring, where people who live in hotter parts of the world have darker skin which can absorb the more harmful rays of the sun while people in colder parts have paler skin which doesn't. This is why fair-skinned people get sunburnt much more easily and get diseases like skin cancer from too much sun. The people who live in very cold parts of the world — like eskimos — are able to survive the cold because their bodies burn up more oxygen and produce more calories than ours, and this keeps them warmer.

But it is really in behaviour that we do most of our adapting. People are found all over the world in all kinds of environments, unlike plants or animals that can only live in certain kinds of environments. We are able to be much freer because we make our own adaptations outside of ourselves. So if we find ourselves in a very cold place, we make warm clothes and build a fire. If we have to hunt our own food, we make the right tools. Through these kinds of adaptations people have been able to live anywhere and live any kind of lifestyle. But we all of us make all kinds of adaptations to our environments all the time. Some people are having to adapt to a very overcrowded and noisy environment, some are having to learn to adapt to an environment in which the air is filthy and polluted or there is hardly any water; some people have to adapt to a lot of violence in the environment, some have to adapt to loneliness and isolation.

Can you think of ways in which you have to adapt to the environment around you? Do you think that it is right that people have to adapt to bad things in an environment? Don't you think that it might be better to change those things instead of changing ourselves to fit in with them?

Write to us about what you think.
Our address is:
UPBEAT
P O Box 11350
Johannesburg 2000

Introducing Astronomy

Thabo is on holiday in Lesotho visiting his grandparents. He is standing outside their house looking up at the sky. Thabo has never seen so many stars before. He wonders why he can see so many more stars in Lesotho than he can in Soweto. His grandfather tells him, 'In Soweto the air is full of smoke. Also there is a lot of glare from the lights of Johannesburg. But here in Lesotho the air is clean and there are very few lights. This is why you can see the stars more clearly than you can at home.'

After looking at the sky in Lesotho for many nights, Thabo begins to wonder, 'What are stars and what makes them shine?' He decides to ask his Science teacher when he goes back to school in Soweto....

Please Sir, can you tell me how big stars are?

Well, Thabo, most stars are about a million times more massive than the earth.

If they're as big as that, why do they only look like tiny spots of light in the night sky?

Theylooklike tiny spots because they are so very far away from us.Our nearest star is the sun. But the next nearest star to us is Alpha Centauri. This star is 30 million million kilometers away! That's like 20 thousand million journeys from Johannesburg to Cape Town.

Wow, that is a long way! Can you tell me why stars shine?

Stars shine because they are extremely hot. The surface temperature of the average star is several thousand degrees centigrade. This heat is produced by a nuclear reaction which changes hydrogen into helium. An immense amount of hydrogen reacts each second. Some stars use up a billion tons of hydrogen every second. This is like many billions of hydrogen bombs exploding at once. As the hydrogen changes to helium it burns with a great heat that causes the star to shine.

STARS

This picture shows the CRAB NEBULA. At present it is cloud of gas in space. Eventually it will squeeze up to form a star.

THE LIFE OF A STAR

1. A Star is born

Every star was once just a cloud of hydrogen gas thinly spread over a large region of space. But all the tiny particles which make up this cloud of gas are attracted to each other. Over millions of years the attraction of the hydrogen particles for each other causes the cloud of gas to squeeze up into a dense ball.

2. The Star shines

The pressure inside the ball of gas becomes very high. This causes the temperature to rise very high. In fact the temperature rises high enough to start start nuclear reactions. After the nuclear reactions have started the temperature inside the star can reach over 20 million degrees Centigrade. The heat from these nuclear reactions produces light. This light causes the star to shine.

3. The Star burns up

As the star shines it uses up a lot of energy. This causes the star to lose mass. For every 4 hydrogen atoms which burn, one helium atom is made. This one helium atom has a smaller mass than the 4 hydrogen atoms.

The sun has already lost one tenth of its original mass. But it has been shining for 5 thousand million years, so it will be a long time before it burns all its hydrogen up!

4. The Star dies

Towards the end of its life a star begins to burn very fiercely. This causes the temperature to rise even higher. This makes the star expand (get larger). Once the star has expanded it starts to cool down. This cooling down gives the star a reddish colour. That's why people call these stars RED GIANTS. The cooling down causes the star to contract (get smaller). The star goes through several periods of expanding and contracting until all its hydrogen is used up.

When all the hydrogen is used up the star dies. In other words the star becomes very dim and hardly gives out any light.

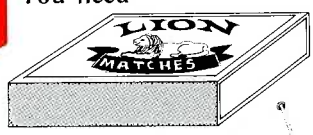
The sun will also die one day. But this will only happen thousands of millions of years from now. So none of us alive today need worry about it!

DO IT YOURSELF

MAKE A TICKING CLOCK

You can make this toy clock out of a matchbox. It is fun to make. Your young brothers and sisters will love it because it really ticks!

You need —



An empty matchbox

2 pins

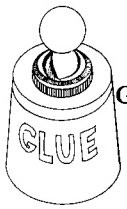
A paper clip

A small blob of plastecine or putty or mud (Size of finger nail)

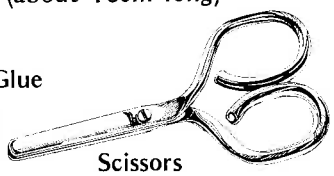
A piece of wool (about 10cm long)

A small piece of white paper.

A small piece of coloured paper or white paper and crayon or paint



Glue



Scissors

What You Do

1. Separate the tray from the cover of the match box. The cover is the main part of the clock. You will make the pointed roof of the clock out of the tray.
2. Measure the short side (AB on this diagram) of the tray. You can use a ruler or your piece of wool for this. Now measure the same distance on the long side of the tray. Make a dot with a pen or pencil at point C as on the diagram. The distances AB and BC are the same. Now cut from point C to the base of the tray (point D on the diagram), with your scissors.
3. Cut along the base of the tray from point D to the corner beneath point A. Then cut up to point A so that you have 2 pieces. You now have a triangular shaped piece like the shaded part of the diagram. Keep this part because it is going to make the roof of your clock. You do not need the other part of the tray.
4. Tie your piece of wool onto the end of the paper clip.
5. Cut a piece of coloured paper the same size as the cover of the match box. Stick it on with glue. You can use white paper and colour it with a crayon or paint. Make 2 dots in the positions shown on the diagram.
6. Push the pins through the cover of the match box at the 2 dots. Do not push the pins through the other side of the cover. The points of the pins must be in the space between the two sides of the cover.
7. Hold the cover with one hand. With the other hand push the paper clip up into the space between the two sides of the cover and hang it on the pins. When the paper clip is hanging on the pins, push the pins through the other side of the cover. The pin heads are now flat on one side and the points stick out of the other side.
8. Glue the 'roof' of the clock on to the cover.
9. Cut a small circle of white paper to fit on to the front of your clock. Draw in the numbers and the hands of the clock. This makes the 'dial' of your clock. Glue the dial on to the front of the clock.
10. Stick your piece of plastecine or putty or mud on to the end of the wool. This makes the 'pendulum' for your clock. With one hand hold the clock by the two pins which stick out of the back. With the other hand swing the pendulum — your clock ticks!

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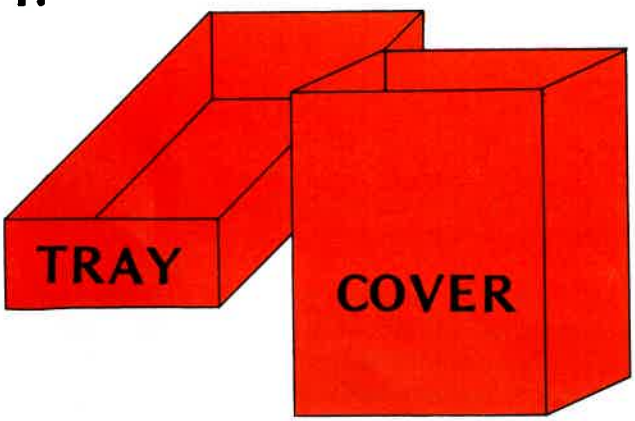

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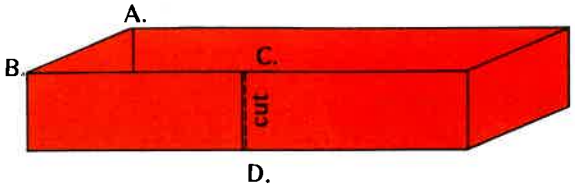
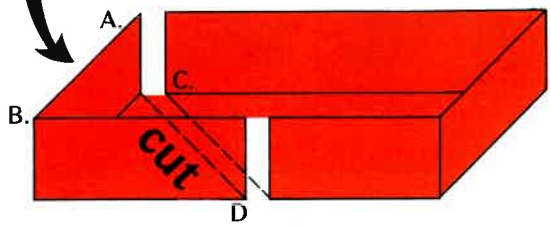


3. keep this bit



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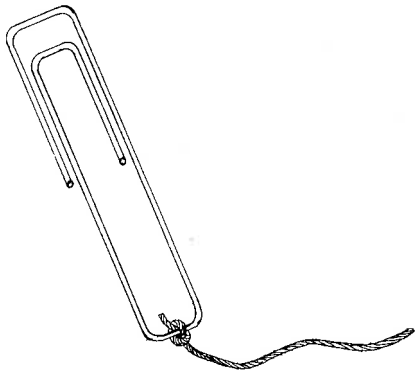

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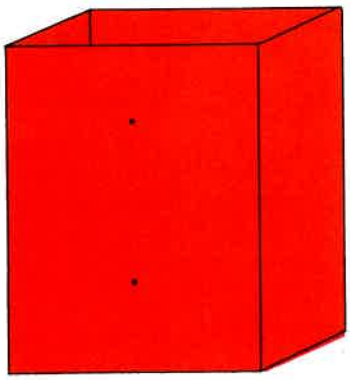

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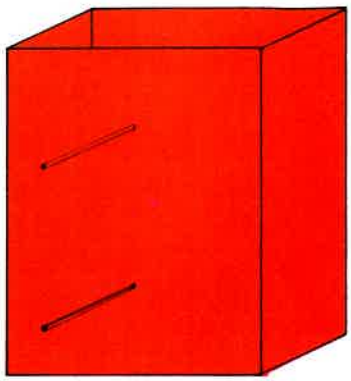

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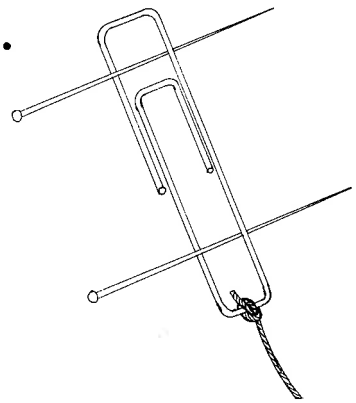

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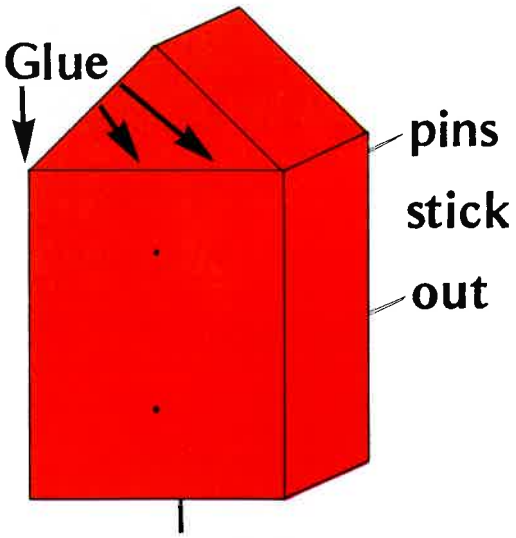

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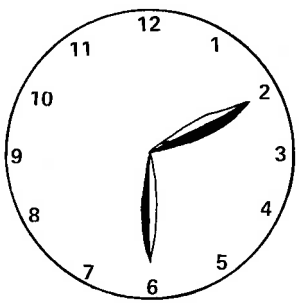

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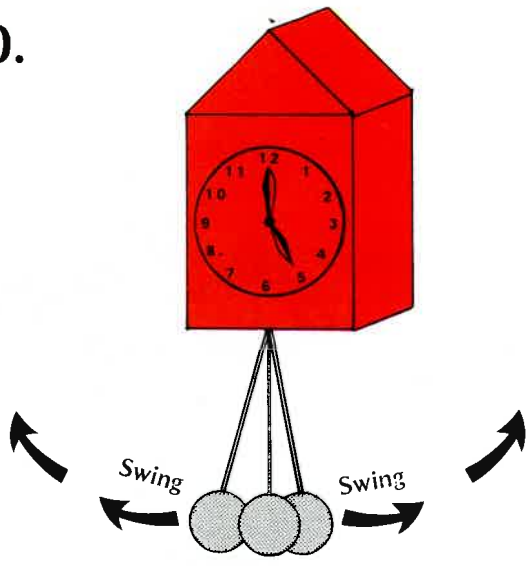
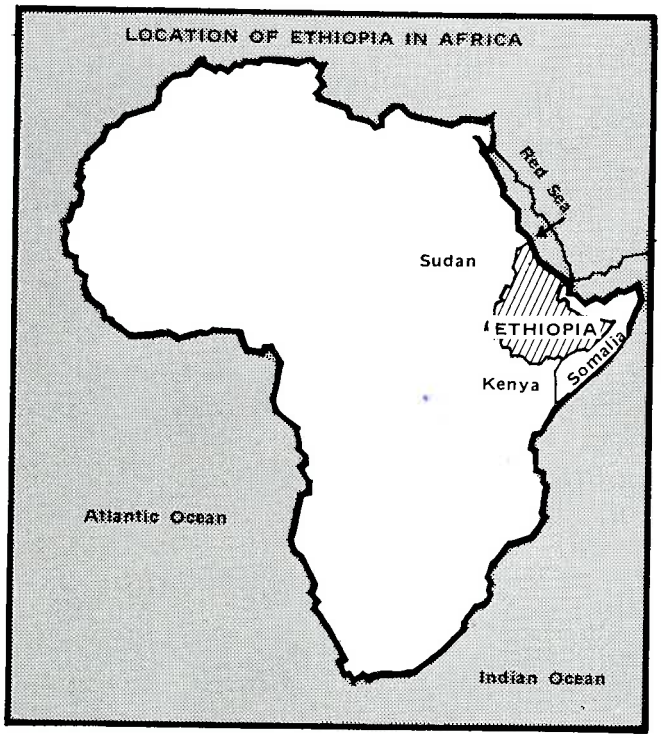


AFRICA....



We started our journey across Africa in the north western part of the continent. We have travelled through ALGERIA, LIBYA and EGYPT.

Our journey continues, as we come down the Red Sea from Egypt and get off the boat at the port town of MITSIWA in a country called ETHIOPIA. As you can see from the map Ethiopia is in that part of Africa which is sometimes called the 'horn'. The shape of the map will tell you why it has this name. Ethiopia shares its boundaries with many other countries. To the west there is Sudan. The Red Sea and Somalia make up the Eastern neighbours and to the south is Kenya.

Our journey into Ethiopia will take us from the port town of MITSIWA on the Red Sea, up to the town of Asmara and then on to AKSUM. At AKSUM we will look into some of the past history of Ethiopia. We then head for the capital of Ethiopia, ADDIS ABABA. In Addis Ababa we will join some Ethiopian friends who will tell us something about present day Ethiopia.

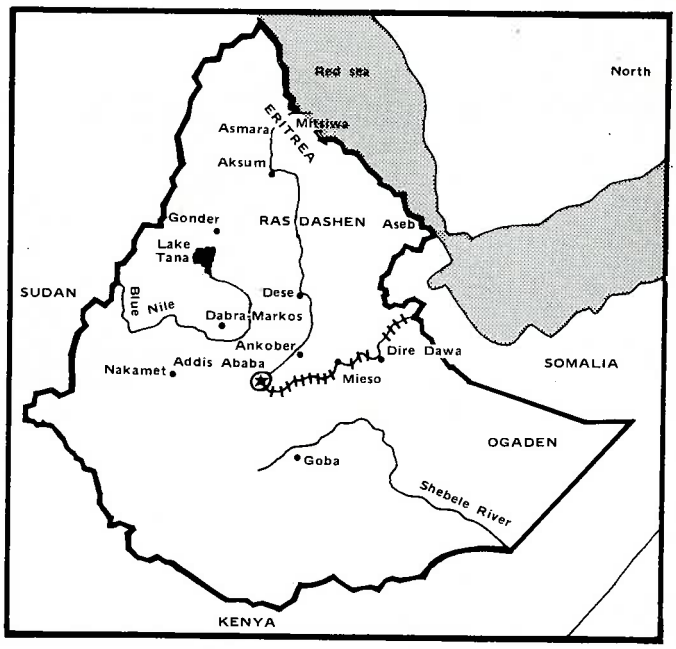
MITSIWA to ASMARA

Mitsiwa is one of the port towns of Ethiopia. It is not used a great deal for trade. Instead Ethiopia uses the port of DJIBOUTI for most of its trade. Mitsiwa is very hot. In fact, the port and other areas on this coast of the Red Sea are perhaps amongst the hottest regions in the world. We quickly leave Mitsiwa and make our way to Asmara. The road to Asmara is a steep and winding road. We are leaving the sea coast and climbing towards the higher parts of Ethiopia.

As we journey across Ethiopia we will see that it is a country that is very mountainous in parts. Although the distance between Mitsiwa and Asmara is not great, our journey takes a long time because the roads are steep and full of bends and turns. We also notice many soldiers of the Ethiopian army as we approach Asmara. Asmara is situated in that part of Ethiopia calle Eritrea. Eritrea has become a centre of war and tragedy for Ethiopia.

Eritrea was at one time an Italian colony. In the second world war (1939 - 1945) the Italians were defeated by the British and Ethiopian soldiers in Ethiopia. As a result Italy lost her colonies in the north eastern section of Africa. In 1950 the United Nations handed over Eritrea to Ethiopia for administering.

At first, Ethiopian rule over Eritrea was accepted. However, as the Ethiopian government gained more control, the Eritrean people began to oppose Ethiopian rule. And so, since the 1960's this part of Ethiopia has experienced war.



ETHIOPIA

We arrive in Asmara just as the sun goes down. It is certainly a lot cooler in Asmara than it was at Mitsiwa. Asmara is one of the larger towns in the northern part of Ethiopia. As we settle in for the night, we hear the firing of guns and loud explosions. The sounds don't appear to be too far off. Naturally, we are afraid but there is very little one can do about it. And so we stay in doors. The sounds of guns and explosions continue through most part of the night. And as the early morning sun begins to show over the hills, we fall asleep. In the morning, we are told by our friend that the sound of the night came from a town about 15 kilometres from Asmara. The town, which was occupied by the Ethiopian government troops, was under attack by the guerillas of the Eritrean Liberation Front. The Eritrean Liberation Front is one of the organisations fighting for the breakaway and independence of Eritrea. No news has been received from the town under attack.

The Eritrean's fight against the Ethiopian government has been going on for nearly 20 years. During this time many thousands of people have been killed. In addition, as in all wars, hundreds of thousands of people have fled their lands and homes,and now live their lives as refugees in the neighbouring country of Sudan.

ASMARA to AKSUM

The next stage of our journey is from the town of Asmara to Aksum. We travel along the road, that will eventually take us to the capital of Ethiopia — ADDIS ABABA.

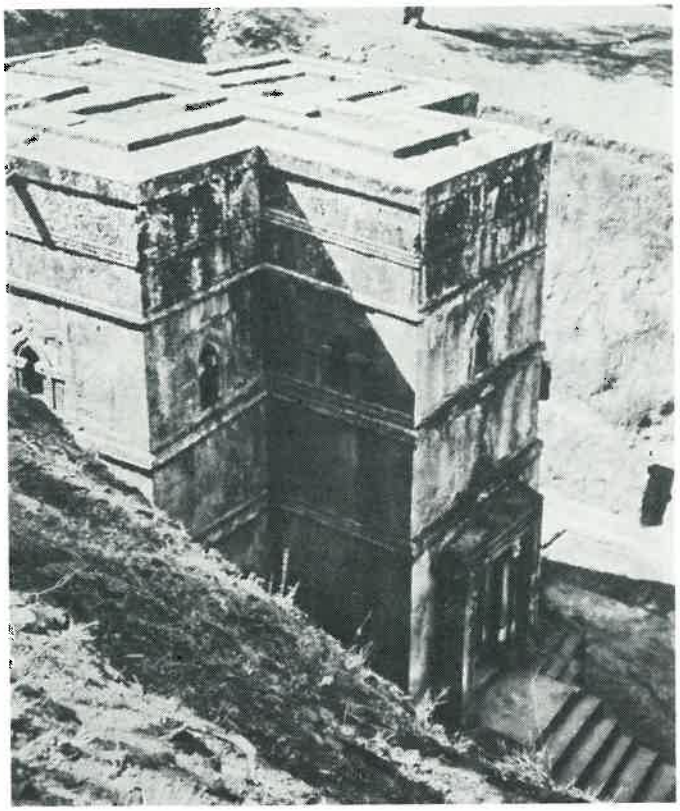
We are visiting Aksum to learn something about the early history of Ethiopia. About 2 500 years ago, the city of Aksum became the centre of the Aksum empire. It was a powerful empire, extending its rule through parts of the north and eastern areas of Ethiopia. Through the ancient port of Adulis, near the present day Mitsiwa, a great deal of trade was carried on with many lands across the Red Sea and also with the surrounding areas in Africa.

The Aksum empire grew and about 2 000 years ago reached its glory as an empire.

As we walk around Aksum we see what remains of the great past history. Gigantic columns (called STELAE), a huge stone table, (over 17 metres long; 6½ metres wide and 1,3 metres thick) massive throne bases, pieces of column, and royal tombs, all point to a powerful empire. As we stop to examine the huge stone table, we wonder how this gigantic slab could have been moved. It must have taken the energy of thousands of people to move this slab.

The stelae also cause us to wonder. These are huge stone columns with the tallest being 33 metres. Some of the stelae are just trimmed stones, others have smooth sides and curved tops. The one that attracts our attention has remarkable decorative carvings. The carvings seem to be that of a multi-storyed building.

Historians and archaeologists have been trying to find out the meaning of the carvings on the stelae. What is almost certain is that the columns were part of the burial grounds of the ancient emperors. More and more information of this early part of Ethiopia's history is being gathered.



1. The Church of St George. One of the churches built out of solid rock during the time of King Lalibela.

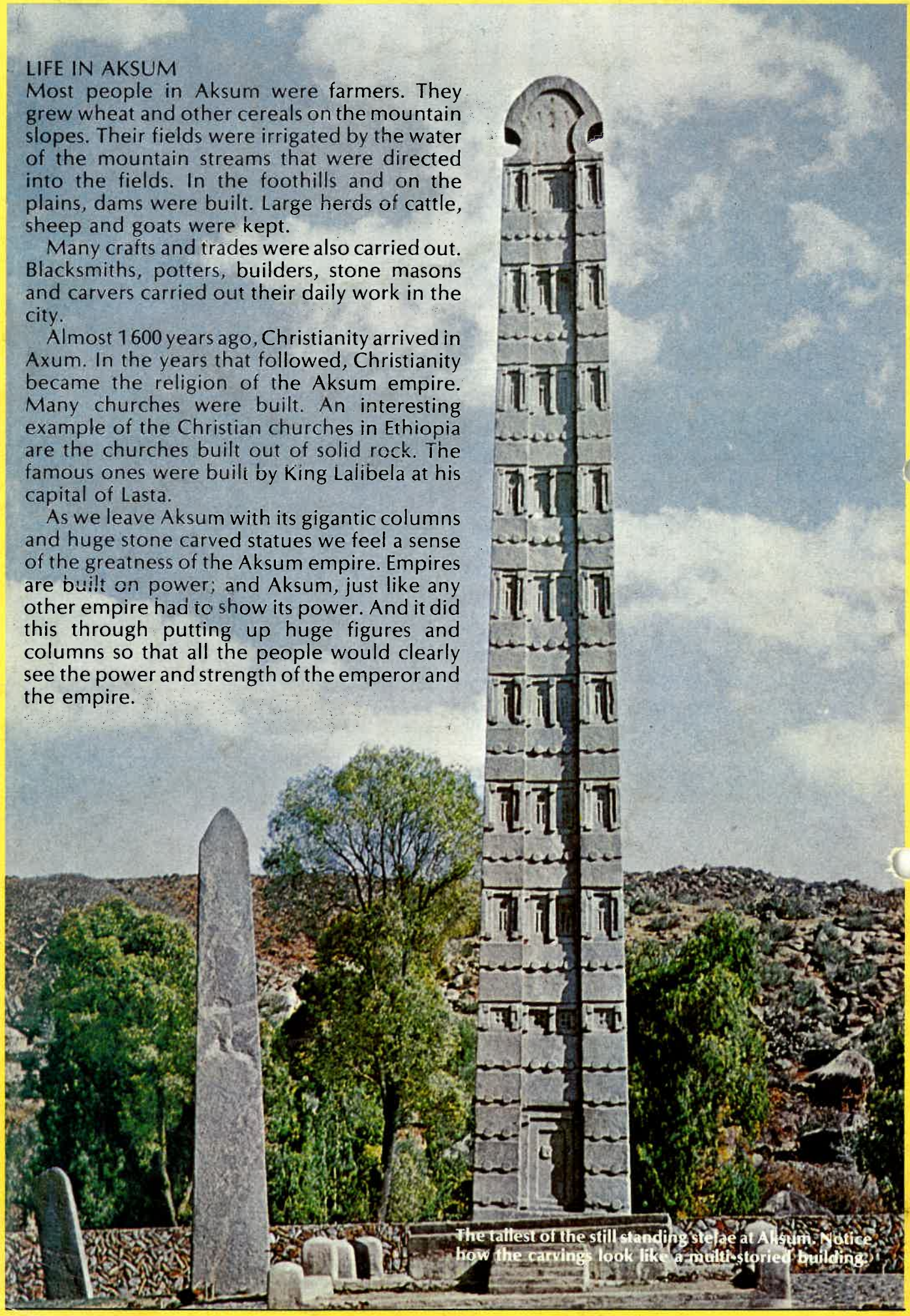
LIFE IN AKSUM

Most people in Aksum were farmers. They grew wheat and other cereals on the mountain slopes. Their fields were irrigated by the water of the mountain streams that were directed into the fields. In the foothills and on the plains, dams were built. Large herds of cattle, sheep and goats were kept.

Many crafts and trades were also carried out. Blacksmiths, potters, builders, stone masons and carvers carried out their daily work in the city.

Almost 1600 years ago, Christianity arrived in Axum. In the years that followed, Christianity became the religion of the Aksum empire. Many churches were built. An interesting example of the Christian churches in Ethiopia are the churches built out of solid rock. The famous ones were built by King Lalibela at his capital of Lasta.

As we leave Aksum with its gigantic columns and huge stone carved statues we feel a sense of the greatness of the Aksum empire. Empires are built on power; and Aksum, just like any other empire had to show its power. And it did this through putting up huge figures and columns so that all the people would clearly see the power and strength of the emperor and the empire.



The tallest of the still standing stelae at Aksum. Notice how the carvings look like a multi-storied building.

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