RICHARD BRADSHAW AND HIS SHADOW PUPPETS
TEACHERS' NOTES

LIGHT AND SHADOW

Without light there are no shadows.

We can begin a study of shadows by standing in front of a light, even the sun, and looking at the shadow we make. The shadow has no thickness, and takes the shape of what it falls on. We stop the light from going through us, but our shadow is not absolutely black. That's because there is other stray light falling where our shadows is. That light is usually reflected off other things. If we are outside this light may come from the sky. The air above us doesn't really reflect the light, but "spreads" it around a bit. (From the moon the sky looks black because there is no air.)

Look at the edge of the shadow. It is a little blurred. The bigger the light, the more blurred the shadow is, and the shadow gets sharper as the light gets smaller. A very small
light like a torch globe makes very sharp-edged shadows. If a big light is far enough away it acts like a small light source and makes a sharp shadow.

Look at the shadow made by a piece of coloured cellophane. The cellophane lets some of the light straight through so the shadow is coloured.

Candles, car headlamps, clear light globes, the sun and the moon make good shadows, but frosted or pearl globes, fluorescent lights and lights with shades over them do not.

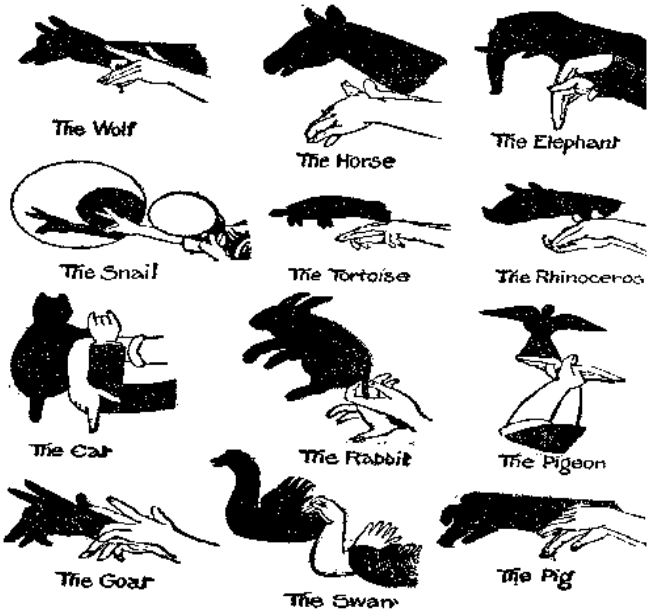
Nowadays most of us have seen ourselves in photos or on video, but before there were mirrors people didn't have much idea of what they looked like. They were lucky if they saw their reflections in a still pool of water and the only other idea of what they looked like might come from their shadow. Before photography rich people could have their portraits painted. A cheaper way was to have a "silhouette" made. This could be done by an artist, but it could also be done by sitting the person sideways near a wall and tracing around the shadow of his/her head made by a candle. (The word "silhouette" comes from the surname of a man who was the Finance Minister in France in over 200 years ago.)

You could try making silhouettes of each other on paper, and instead of a candle you could use an overhead projector for the light.

If the shadow falls on something like a sheet hanging between the light and a person watching on the other side, that person will see the shadows through the screen.

You could try hanging up a screen and then holding various things in different positions to see if people on the other side can guess what is making the shadow.

You could also try making shadow pictures on the wall using your hands. It is fairly easy to make a dog or a bird, but here are some other suggestions. They come from The Drawing Room Entertainer by C.H.Bullivant, first published in 1903.



SHADOW THEATRE

Shadow Theatre began in Asia. Written records go back a thousand years, but the art may be twice as old as that. It was the earliest way of putting a moving image on a screen and was a forerunner of cinema and television.

Traditional figures were usually cut from specially prepared leather. Some leathers, such as parchment, allow light through and when these were coloured with dyes instead of opaque paints it was possible to get coloured shadows. The screen was made of cloth and the light source was an oil lamp. The audience on the other side of the screen saw the shadows through it.

Shadow theatre began either in India or China; opinion is divided. From India it spread to Indonesia, Thailand and Malaysia, and the stories often came from the two great Hindu epic poems, the Ramayana and the Mahabharata. Shadow puppets from these countries are usually worked with rods from below. From China the idea of shadow puppetry spread to the Persia, Arabia ,Turkey, Greece and North Africa. Shadow puppets from these countries are usually worked with rods from behind.

In the second half of the eighteenth century [from about the time of Captain Cook's voyage to New Zealand and Australia] shadow puppets became popular in France, Italy, Germany and England, but here the shadows (silhouettes) were not coloured. (The French had learnt of shadow puppets through a book about China written by a Jesuit priest and still call shadow puppets "les ombres chinoises" which means "Chinese shadows".) The first item in my program, "The Broken Bridge", is based on a song performed by shadow puppets in France over 200 years ago.

The invention of the cinema was a much better way of putting moving images on a screen, and gave movement to photographed images. With cinema the images don't really move; they change so quickly that they give an illusion of movement. Shadows can be made to "move" in the same way using a process called "stop-motion" which is also used for animated cartoons. For this the shadow-screen is horizontal, like a table, and has a light shining up from below while a camera looks down from above. The jointed figures are placed flat on the screen and a series of pictures is taken by the camera, with the figures moved slightly between each photo or "frame". When these images are projected in rapid succession on to a screen they seem to move. Using this technique and silhouettes German-born Lotte Reiniger (1899-1981) made the world's first full-length animated film, *Prinz Achmed*, in 1923-6.

When the Hogarth Puppets from England toured Australia for Joan and Betty Rayner in 1952, mainly using marionettes, they brought with them a play, *The Happy Prince*, which they acted out with shadow puppets made by Lotte Reiniger. Their visit created a new interest in shadow puppets in Australia which led to the show that I now present. In fact, it was Joan and Betty Rayner who first toured my show to schools in Australia and New Zealand in 1969-70, and Lotte Reiniger saw the show at the Wigmore Hall in London in 1979.

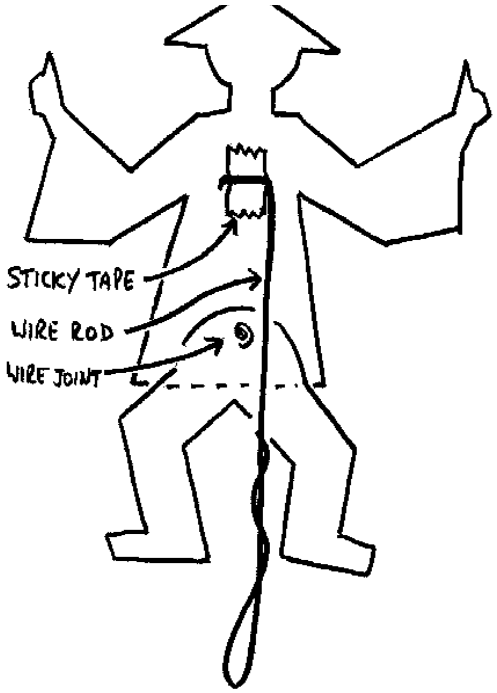
PLAYING WITH SHADOWS

It is not necessary to have a shadow puppet screen to begin with.

A desk lamp or even the sun can be a source of light and you can hold up different cardboard shapes to see their shadows on the ground or on a wall. Another way to see the shadows is to put the shapes on an overhead projector.

Colours can be added to the shadows using see-through plastics or cellophane. It is better to attach the cellophane with sticky tape rather than glue, because cellophane often shrinks and buckles after glue has wet it. Clear plastic sheeting can

also be used and coloured with felt-tipped "marker" pens. To get a good strong black on the clear plastic you can use black "Contact" plastic, the kind that comes in rolls with a paper backing that must be peeled off to expose the sticky backing.



To avoid getting the shadow of your hand, a length of thin stick or wire can be taped on to the shape to make a handle.

If you bend the wire as shown in the picture, you can tape it on to the shape so that the rod will fold down flat for storing. Masking-tape is good for this. You can used thin coat-hanger wire or 2mm soft iron wire ("tie-wire" or "baling wire" which is bought in coils at hardware stores) and it may be wise for an older person to prepare a number of rods before a shadow-making session. [You will need wire-cutters to cut the wire, and pliers to make the square hook.]

The masking-tape won't last forever so a stronger way of attaching the rod is to use a strip of cardboard glued on with contact cement instead. [Be careful when using contact cement, and try not to get it on your fingers. Don't use too much. Spread the thinnest possible layer on both surfaces, wait for the glue to become touch dry, then press the surfaces together.]

If you want to add movement to the shadows try making the shadows in two pieces, a top part where the rod is attached, and a second part [e.g. legs] hanging from it. You will find that you will need to make the pieces overlap. You need to use a cardboard that can be cut easily with strong scissors, and to start with you can use an empty cereal box, or the back of a writing-pad.

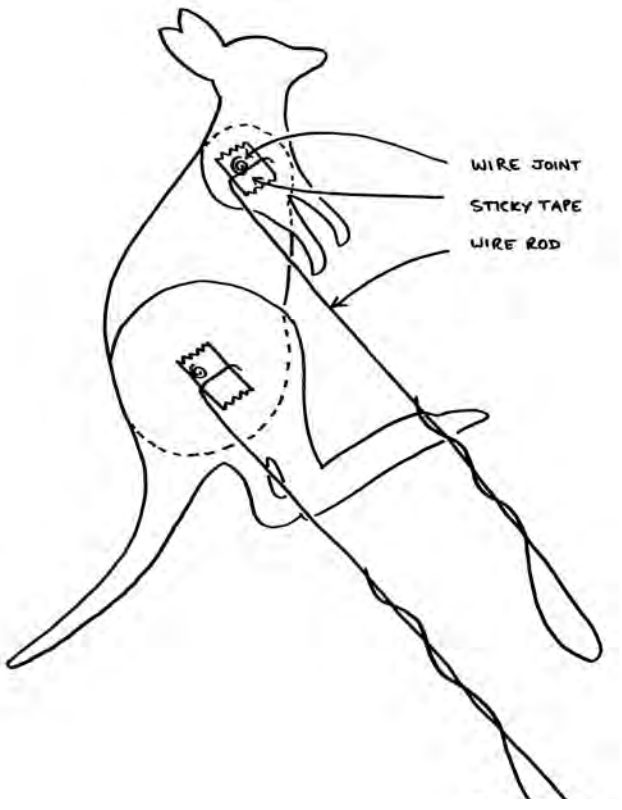
The easiest way to join the parts is with thin wire, such as 24 gauge copper or steel wire. Make holes in both of the cardboard pieces with a drawing-pin, push a piece of wire (about 9cm) halfway through, and wind it into a flat coil on both sides. You could also use brass split fasteners, but they don't give such free movement, and they also tend to make the hole larger. Some books suggest string or thread knotted on each side, but this is a much fiddlier way of making the joints than using thin wire.

Tape the square hook of the wire rod on to the top part and try moving the puppet by holding the rod by the other end.

[A neater way of making handles for the rods is to use a piece of wooden dowel instead of twisting the wire to make a handle. This needs to be done by an older person, because a hole needs to be drilled into the end of the dowel. Cut a length of the dowel (e.g. 20cm of 1cm diameter dowel) with a saw and mark where the hole is to go in the centre of one end of the dowel with a sharp point, such as a drawing pin. The dowel needs to be clamped into a vice with the marked end held upward in the jaws, before a hole about 2cm deep and 2mm in diameter is drilled into it. A length of wire (e.g. 20cm) is then glued into the hole using a 5-minute epoxy glue such as Araldite. Mix the two parts thoroughly and use the glue sparingly. When the glue sets, make the square hook at the end of the wire with pliers.]

A PUPPET WITH TWO RODS

You can get much more interesting movement from a puppet which is worked with two rods, one for each of your hands. Make the puppet in three pieces, with two wire joints. [See illustration



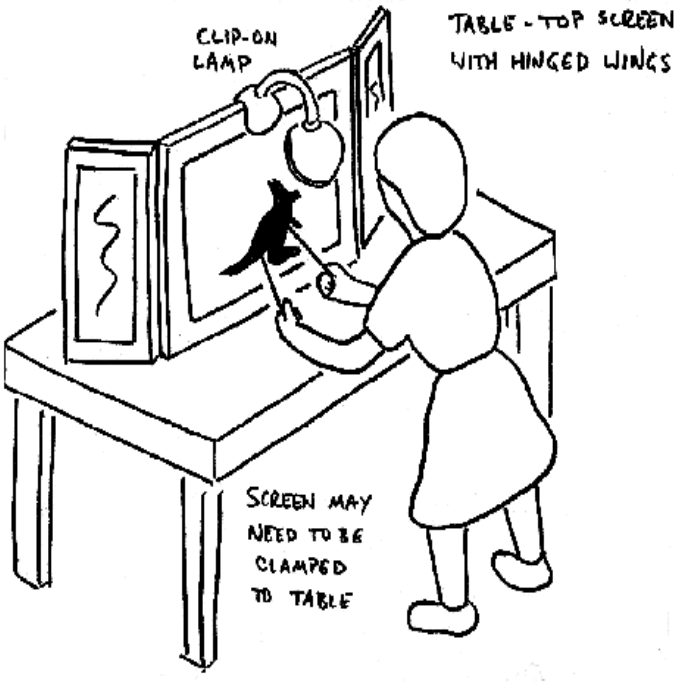
The main problem here is allowing for overlapping of the pieces when they are cut out. I usually get people first to cut a shape out of cardboard, and then to use this shape as a "template" for the three pieces. Before tracing around the shape, make holes in it with drawing-pins where you want the joints to be, then pin the "template" to the cardboard before tracing so that the holes are already located. Once you are used to the process you can sometimes cut two of the pieces out of the "template" after you have traced out the middle piece which has the two holes in it.

Your 3-piece figure has a middle piece with two holes for joints in it, and two outside pieces, each with only one hole. The rods are to be attached to these outside pieces, and it's usually best to attach the rods fairly near to the joints. When

you hold one rod still with one hand, you should be able to rotate the other rod so that only the piece it is fixed to moves. If you move the rod instead of simply twisting it you can begin moving the middle part as well. If you now try moving and twisting both rods together the figure will become quite animated.

A SHADOW SCREEN

For class-work a piece of white cotton sheeting can be used, and a screen can sometimes be improvised by pinning the sheeting across a doorway or window, or stringing it between the legs of an upturned table.



A better screen can be made by stapling the sheeting to a wooden frame. You will need to find some way to keep the screen in position and one good way is to hinge on side pieces which fold out towards the audience. Such a screen can rest on top of a table.

While cotton sheeting is adequate, there are better materials, and a heavy white nylon such as "Oxford cloth" is very good. I once found a heavy white rayon which was excellent. Look for these three properties in material for a screen, whether it be cloth, paper or plastic:

1. It should look white (not frosted like tracing paper).
2. When held flat on printing you should be just able to read through it.
3. When it is held up towards a light source you should not be able to see the source itself.

The ends of the little wire joints sometimes catch on a cloth screen but a piece of clear sticky tape over the joint on the screen side avoids this. If you find that the noise the puppets make as they move on a stretched fabric screen is annoying, you could consider putting a layer of thin clear plastic across it.

[My own screen is actually in three layers, but I don't recommend it for schools because of the difficulty in getting the plastics. However, for the record, on the audience's side there is a sheet of clear plexiglass about 1.2mm thick. This is the kind of plexiglass sheeting that has one non-reflective surface, and it is this side which faces the audience so that stray light in the hall is not reflected. The plexiglass is screwed to the wooden frame on my side with flat-topped counter-sunk screws. Taped to the plexiglass around its edge is a slightly smaller screen of white styrene about 0.25mm thick. This is the actual shadow-screen, and it is thin so that the edges of the shadows are not blurred. However, because it is thin it needs the more rigid plexiglass in front to support it. Finally a thin clear plastic, in my case a transparent sheet of 0.25mm rigid PVC, is taped across my side of the white styrene because the styrene marks easily. My screen is roughly 1 metre wide and 3/4 metre high.]

Although I have not yet tried it, I would think that a large sheet of white paper which has been laminated with plastic could make a very good screen.

THE LAMP

An ordinary clear light globe will cast a sharp shadow when a puppet is held flat against the screen, but it will also cast sharp shadows of the rods. The best position for the light is usually about 40 cm behind the middle of the top of the screen, so that it is between the puppeteer and the screen. In this position the shadows of the puppeteer's hands are less likely to fall on the screen. The problem is that fixing the light here is not a simple matter.

A white or frosted globe in this position will cast less distinct shadows of the rods but still give sharp shadows of the puppets when they are against the screen. I used to use large 200-watt "softlight" globes but these are no longer readily available. (In America GEC now manufacture such globes for reading lights for people with sight problems. These are readily available in drugstores and perhaps a similar lamp may appear here.) I get my present lamps in supermarkets in France! They are 150-watt halogen lamps in the form of white globes. While these are not available in Australia, the next best thing has just reached the Australian market and is available from lighting specialists. Made in France, it is a Philips halogen 150-watt pearl lamp, 13650 ES. (The "ES" means that it has an Edison-Swan screw base, not a bayonet fitting.) Failing these, it is also possible to use a diffusing filter available from a theatre lighting supplier in front of a clear lamp.

An easily available alternative which gives reduced rod shadows without altogether eliminating them is a halogen floodlight. These come already mounted with shades and reflectors, but you would need to devise some way of suspending the lamp

behind the screen. A small 150-watt lamp would be bright enough for a small screen, but much brighter lamps are available. These lamps get very hot, so should suspended above children's head level.

For a very large screen a fluorescent tube can be used as the light source, but the disadvantage is that although the rod shadows will virtually disappear, so do parts of the puppet unless they are quite flat against the screen.

It is not always easy to fix the light in the optimal position and it may be simpler to hang the light high on a wall behind the screen. The rods will make shadows, but these will often fall downwards across the shadows of the puppets.

A reading lamp could also be set up on the table supporting the screen with the puppets worked over it, but the lamp would be a bit in the way. The shadows of the rods would now be cast upwards on the screen, as is usual in the Greek and Turkish shadow shows.

An overhead projector can also be used as a light source. The rod shadows will be quite distinct, but on the other hand scenery can be projected by putting transparencies on the projector.

USING SHADOW PUPPETS

It is very easy to get frustrated with shadow puppets. They are limited in what they can do, and it is not easy for them to turn around or cross each other. At the same time the shadows often look very good, and are easier to make in a classroom than other kinds of puppets.

Because of these limitations it may be best to avoid long stories. Try short scenes, circus acts, simple fables or legends etc.

They are very good for serial songs such as *Old Macdonald Had a Farm*, *The Old Lady Who Swallowed a Fly,* or *The Gingerbread Man.* They also suit processions such as for *Noah's Ark* or *The Drover's Dream*.

Remember that shadow puppets worked from behind don't have to stay on the ground. They are ideal for underwater scenes or stories where things fly through air or space.

If you are really adventurous you could try using abstract shapes to illustrate music.

OTHER ACTIVITIES

Find out more about shadow puppets from books in the library, especially encyclopaedias. It is fairly easy to get information on the famous shadow puppets of Java and Bali in Indonesia, but other countries which have had shadow puppets are India, Thailand, Malaysia, Cambodia, China, Taiwan, Iran, Turkey, Greece, Egypt, Libya, Tunisia, Algeria, France, Germany, Switzerland, and England.

Children whose families come from Greece or Turkey might be able to find out something about the traditional shadow puppet characters of Karaghiosis and Karagöz.

Other countries have traditional puppets that aren't shadow puppets, e.g. Sicily's marionettes, England's *Punch and Judy*, Vietnam's water puppets. Perhaps you can find out something about them.

Investigate different ways of putting images on a screen: shadow puppets, magic lanterns, slide projectors, overhead projectors. movies, television, lasers, liquid crystal screens etc. Look at the different ways the images can be made to move...or appear to move. (Books on the history of cinema often refer to shadow puppets.)

REFERENCE BOOKS

Some general books on puppetry will include a section on shadow theatre. An excellent recent book is:
"*Shadow Puppets and Shadow Play*" by David Currell, published by Crowood Press [U.K.] in 2007. This book contains many photos of Richard Bradshaw's work and refers to him as "widely regarded as the finest solo shadow player in the world". England

"*Schattentheater/Shadow Theatre: Vol. 2*" [2001], with German and English text, has a chapter by Richard Bradshaw. Volume 3 [2005] has a good technical account of contemporary shadow puppetry. Both are available through:
www.scottishmaskandpuppetcentre.co.uk

PROGRAM NOTES

THE BROKEN BRIDGE

The Broken Bridge, which begins the show, has been in the European shadow repertoire for two centuries. It first appeared in a shadow theatre set up by Dominique Séraphin in the garden of a hotel in Versailles in 1772, and was apparently based on a song already in existence.

In 1784 Séraphin moved his theatre into Paris where it was set up in the galleries surrounding the Duke of Orléans' garden at the Palais-Royal. The theatre continued there through the Revolution of 1789 and its aftermath, past Séraphin's death in 1800, until 1858 when it was moved to the Boulevarde Montmartre. Here, a century later, the shadow-puppet part of the program ended with the celebrated *Le Pont Cassé* (i.e. *The Broken Bridge*). There was a time when all Paris knew the chorus.

The Broken Bridge arrived in London in 1776, when it was presented by rival shadow players from France. (One, Ambroise, was actually Italian). The term used then for shadow theatre was the French one "les ombres chinoises" which became anglicised to "the Chinese shades".

In the 1830s the Punch and Judy men in the streets of London began to perform shadow plays at night. They would stretch a sheet of calico across the openings of their Punch booths and use candles to light it, a rather hazardous procedure which sometimes resulted in the booth catching fire. Such shows continued to appear through Victorian times and became known as "galanty shows" (a term originally used for the magic lantern shows brought to London by Italian showmen) and usually included *The Broken Bridge*.

Why has such a simple little play established itself as a classic of the shadow theatre? It has been suggested that part of its appeal is subconscious, and that the physical gap between the workman and the gentleman symbolises the classic social gap between them. However, from a purely practical viewpoint it could be that the play is ideally suited to shadow puppets technique. It is not easy to turn shadow puppets around on screen, or to have them cross each other, but here the gentleman can exit backwards, cross **under** the workman in the form of a second puppet, and reappear behind the workman in the form of a third puppet facing the other way.

The original version lasted longer, with the workman singing his cheeky replies, and ended with the gentleman sneaking up and hitting the workman. In my version the tossing of the gentleman back to the other side, the collapse of the bridge with the worker on it, and the final flight across the gap by the duck (a superior species in that it needs no bridges) have been added. Ironically this version may be better known these days, even in France where I have performed it on numerous occasions since 1972!

[NOTE: *The Sydney Gazette* of Sunday, 10 June, 1804 announced "the safe arrival in the Colony of a *Galanta Show*, which we suppose to be the first ever imported." This was most likely Australia's first magic lantern. So far the first local reference to a shadow show that I've found was a *Shadow Theatre of Comicalities* in November, 1872 at Mrs Gourlay's Exhibition Rooms in Sydney. This was "from England, just landed...".]

THE CAT CAME BACK

There are at least three different tunes for this traditional song. The tune that I use was brought to North America from South Africa where there was an Afrikaans version which possibly came from Holland. There is another version which is better known in the U.S. and here, and the words for my shadow puppet version have been drawn from both sources.

In the South African version the cat finally dies of shock when it hears an Irishman sing *Rule Britannia*!

[Some years ago I became aware of unexplained laughter during this item when I was giving a performance in a puppet theatre in Brussels. It turned out that the theatre cat, named "Mort Subite" (i.e. "Sudden Death") after a local brew of beer, had stationed itself beneath the front of my screen and was swiping at the shadows.]

HOW THE SUN WAS MADE

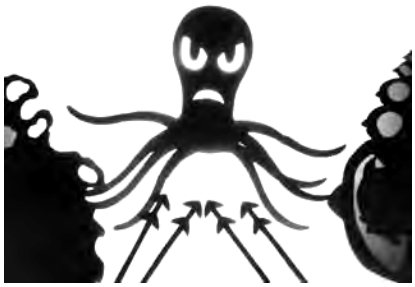
This item is based on one of the Aboriginal tales collected by K. Langloh Parker (Catherine E.S.Stow née Field 1856-1940) and published in London in 1896. She had grown up with Aborigines on her father's station...one Aboriginal girl had saved her from drowning in the Darling...and with her first husband, Langloh Parker, she lived on Bangate Station on the Narran River near Goodooga in northern N.S.W. She respected the culture of the Aborigines, learnt some of their languages, and scrupulously recorded their myths and legends. She was one of the first to have made a serious and sympathetic effort to alert white Australians to Aboriginal culture.
[Although Dinewan is a female, it is actually the male emu which looks after the eggs and the young.]

THE CURIOUS OLD MAN

I made the original Old Man over thirty years ago. Until then I had only done serious items with shadow puppets...with limited success. Someone had asked me to make a shadow puppet to include with examples of other shadow puppets in a talk on puppetry, and when I did the item there was such a good laugh that it inspired me to make other humorous pieces. The original puppet was made in three pieces but worked quite differently, using strings to below stage, and I later tried using rods fixed at right angles to the puppet. At the suggestion of Jan Bussell [director of the Hogarth Puppets mentioned in "SHADOW THEATRE"] I tried working it from behind with two rods hinged to the figure, the technique I've since used for most of the other puppets. I keep the item in the program for "historical" reasons, and use this figure to show how I work shadow puppets.

A TALE OF TWO FISHIES

This is the story of antagonism between two fish based on prejudice. Different significance can be given to the colours of the two fish, green and orange. The colours may be seen as representing the opposite sides in the religious conflict in Northern Ireland, Catholic and Protestant. To many people they have suggested racial differences and to some they have even suggested political differences. The way in which the conflict between the two fish develops from suspicion, to name-calling, to the building of a physical barrier, and on to an arms build-up sadly always has some parallels in the human world. The shark and the octopus can be seen to suggest threats to well-being much greater than those posed by physical or ideological differences. The octopus with its "ink" could suggest environmental pollution. In this tale the accidental removal of one threat conveniently leads to the removal of the other. While this is less common in reality, something of the kind can happen. For instance, a lowering of the number of atomic weapons not only reduces the threat of war, but also reduces the risk of environmental damage through an accident with radioactive material.

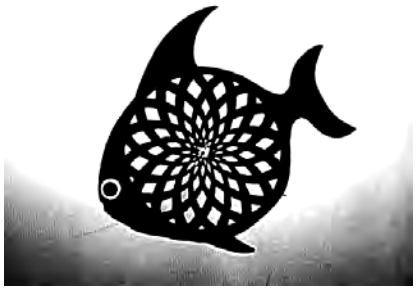


The resolution of the conflict happens quite naturally in this story when another quite basic difference between the two fish is revealed, and they fall in love and have a family of little fish. [It is perhaps worth saying that this is only a surprise because we have assumed the two fish were male, although nothing in the story says this. I also refer to both the shark and the octopus as "he" which I admit is questionable.*] Certainly intermarriage is something which can help to break down prejudice.

Older audiences might appreciate that the family of four, one orange, one green and two mixed, reflects a possible outcome according to Mendel's laws of inheritance.

* When I do this story in French they are automatically "he" and "she", ***le*** *requin* and ***la*** *pieuvre*. However, the gender of nouns can cause problems. In the story of how the sun was made, both the words for an emu and a bird (**un** émeu and **un** oiseau) are masculine yet Dinewan in the story is female.

SOME FISHY FISH



The changing patterns in these fish are mainly produced by rotating one pattern over another. The two patterns can be identical, mirror images, or quite different. Similar effects were produced in the era of "magic lanterns" using rack-and-pinion slides and sometimes you can buy postcard versions where the moving pattern is on a transparent overlay. People wishing to try something like this can make their own patterns either by cutting them out of cardboard or else by making them with black "Contact" plastic (the peel-off, sticky sheeting used for covering shelves). The patterns can be stuck on clear acetate and can even be projected using an overhead projector.

For a couple of the fish only the moving circle has a pattern, the fixed circle attached to the fish being made of clear plastic.

Some of the effects on the fish result from polarised light. If you have access to a pair of polarised sunglasses you can carry out some interesting experiments.

1. Hold the sunglasses in front of you and turn them as you look at a sunny sky or reflected glare. You will see that there is a change as you turn the glasses because some of the light you are looking at is polarised and when the sunglasses are in one position the light doesn't get through. A lot of reflected glare is polarised, and polarised sunglasses can block the glare as well as reduce the total amount of light getting through.
2. Look at a liquid crystal display of numbers on a digital watch or calculator through the glasses and watch what happens as you turn them around. The display comes and goes because it is polarised too.
3. Put pieces of sticky tape, different numbers of layers, between the watch or calculator display and you may be able to see colours. (Some sticky tapes work better than others.) If you have two pairs of polarised sunglasses just put the tape between them and experiment with different positions. It is difficult to give a simple explanation for the cause of these colours but, unlike glass, the sticky tape breaks the light into two parts which "interfere", causing colours.

Polarised light is used for 3-D colour movies. The viewers wear polarised glasses, but unlike sunglasses, one lens is polarised at right angles to the other. Two images are projected on the screen, but they are also polarised differently, so that each of the viewer's eyes sees a slightly different image giving the effect of 3-D. [An older system used one green lens and one red lens to view a green image projected with a red image.]

THE OSTRICH, THE MOUSE AND THE HIPPOPOTAMUS

This is my best known piece. It was recorded for the A.B.C.'s *Play School* as long ago as 1967 and is still broadcast several times a year. It is also in their video of *The All Together Show*. In 1976 Jim Henson (who had by then seen my show in France, New York and, from behind, in New Orleans) recorded this item in London for the first series of *The Muppet Show*, where Kermit introduced it in the episode which starred Ethel Merman. You can also find it on You-Tube!

The mouse is made from a cardboard shape with a piece of rubber band glued on for a tail. There are actually two mice made to face in opposite directions, and the second one is used when the mouse finally enters from the other side.

The see-saw item illustrates some interesting physics. Young children laugh at the simple idea of a small mouse counterbalancing a large hippo. Older children have some idea of levers, but often still think it is ridiculous that so small a weight could lift up the hippo.

Those who have had some introduction to physics will appreciate that the hippo is counterbalanced not by just the weight of the mouse, but in addition by the weight of the see-saw plank itself. The weight of the plank acts as if it were concentrated at its "centre of gravity", and if the plank is uniform this is at the centre of the plank. At first the hippo finds a position where it can just out-balance the plank. If there is negligible friction at the fulcrum, the addition of even a small weight far enough along the plank would be sufficient to tip the balance.

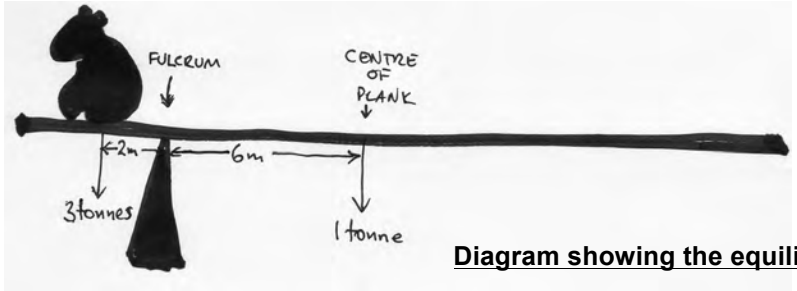


Diagram showing the equilibrium position

Let's imagine:
The hippo weighs 3 tonnes, the plank weighs 1 tonne, and the centre of the plank is 6 metres from the pivot (or fulcrum).

Why does the hippo not slide down at first? This question can lead to a discussion of friction. If the plank was very smooth the hippo would slide the moment the plank moved away from the horizontal. Because of the "roughness" between the hippo and the plank a tendency for the hippo to slide is initially resisted by friction. When the mouse first out-balances the hippo the friction is enough to stop the hippo sliding. However, friction is less between moving surfaces than when there is no relative movement. The final move of the mouse jolts the hippo into motion and the frictional resistance is now insufficient to stop the hippo sliding.

SUPERKANGAROO

The chorus of this song is misleading. It says "You're a dinky-di, bonzer bloke" and "bloke" usually refers to a male. Although not everyone realises it immediately, Superkangaroo is certainly not a male because a joey appears from her pouch at the end of the item! Superkangaroo's notions of justice are no more the domain of males than of females and these days we should resist the notion that the protector of "Truth, Justice and the Australian Way" must necessarily be male. Similarly the end of the item challenges the assumption that cherubs must be fair-haired and white. In performances in Australia the joey holds an Aboriginal Land-Rights Flag. While even Superkangaroo would be hard-pressed to achieve justice here, she can at least attempt to counter the injustice.

When the digger finds a nugget in the goldfields,
And he thinks his dreams of wealth have all come true,
If a bushranger should come to take it from him,
It's another job for Superkangaroo!

[*Chorus*]
Superkangaroo, Superkangaroo,
You're a dinky-di, bonzer bloke, and we like you;
Superkangaroo, Superkangaroo,
It's another job for Superkangaroo!

When the koala makes his home up in a gum tree,
And he spends his day admiring all the view,
If a timber-man should come to take it from him,
It's another job for Superkangaroo!

When the farmer buys a prize ram at the sheep-show,
And he plans to have it meet a pretty ewe,
If a sheep-stealer should come to take it from him
It's another job for Superkangaroo!

When the Aborigine builds his gunyah in the Outback,
On a piece of land that's worth a cent or two,
If a bulldozer should come to take it from him,
It's another job for Superkangaroo!