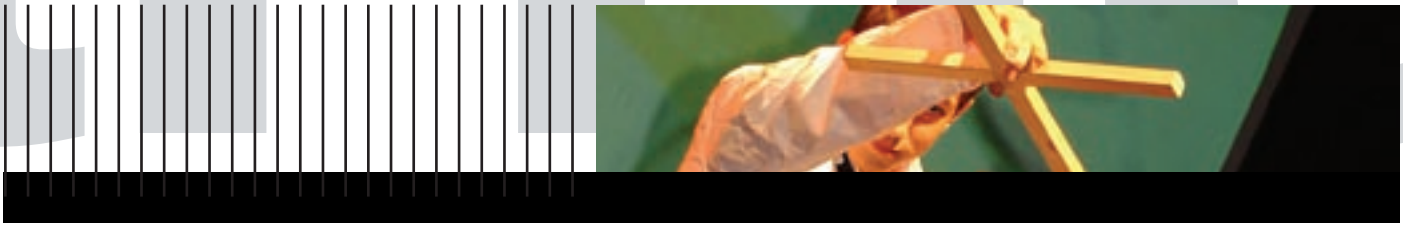
# The Drama of Science

# Drama of Science Pack



This pack has been written by Jeff Teare. Jeff is a theatre director of many years experience with over 100 professional productions to his name. Jeff has also often worked in the community and education sectors. For the last three years Jeff has specialised in the area of biomedical Science-based Drama in secondary schools. He has been involved with the presentations of over 80 schools' Science/Drama projects and directed, co-devised or been in some way responsible for about fifteen of these. He is currently (October 2004) working as consultant/director on the Theatre Royal Plymouth's Theatre of Science project. In addition Jeff is working with Tinderbox Consultants Limited on the **Drama of Science**.



## 1. WHAT IS THE DRAMA OF SCIENCE?

**The Drama of Science** is about raising pupils' understanding of biomedical science issues. It involves a workshop, education pack and video describing a process of how to use drama to explore and express biomedical science issues: practical, moral and ethical. It aims to help pupils explore these issues in an exciting and stimulating way. It is (currently) mainly aimed at Key Stage 4 students.

**The Drama of Science is funded by the Wellcome Trust.** It is intended to contribute to the Wellcome Trust's public engagement activities that aim to 'deepen the understanding of the impact of Science on society' and to 'heighten awareness and understanding of scientific issues'.

**The Drama of Science** is based on experience gained from:

Consulting on and evaluating the Wellcome Trust's flagship project for the Year of Science - SCIENCE CENTRESTAGE (2002). Science Centrestage was a national programme of ten regional workshops (Glasgow, Newcastle, Belfast, Manchester, Birmingham, Oxford, Cambridge, London, Cardiff and Bristol) involving 91 schools, ten regional festivals involving 63 schools and a final event in London involving six schools. In all over 1500 students, teachers, scientists and drama practitioners were involved.

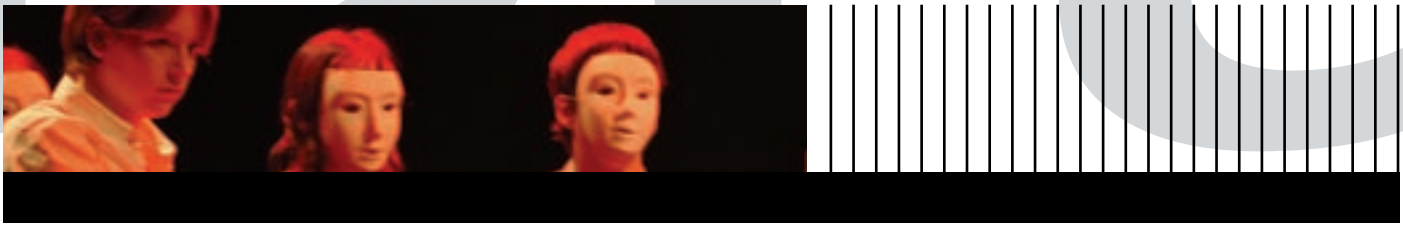
Advising on and co-organising (with the Hurst School) the Newbury Science/Drama Festival (2003) involving six schools, over 130 participants and 400 audience members.

Running the Plymouth Science/Drama Festival involving four schools, over 100 participants and 350 audience members.

Work undertaken on audience workshop techniques at Easington School (2003) and script development in the IMAGINING THE FUTURE project (2003-4). Imagining the Future was a week-long workshop for writers and scientists resulting in three scripts to be professionally performed as part of the Theatre of Science (2004-5).

Two Drama of Science pilot projects at the Westgate School in Winchester and Ridgeway School in Plymouth (2004).

The 'Club PreD' project at the BA Festival of Science at Exeter (2004). 'Club PreD' was a three day demonstration of the Drama of Science process and final production by Year 12 students from Ridgeway School.



So far, over 100 schools have been involved in these projects in Scotland, Northern Ireland, England and Wales but especially in the Newbury and Plymouth areas.

Among many subjects already discussed, researched and dramatised are:

- **DNA structure, genes and chromosomes**
- **Inherited Diseases (CF, Huntington's, Sickle Cell, Brittle X Syndrome etc.)**
- **ADHD**
- **HIV/Aids**
- **Genetic Engineering**
- **Gene Therapy**
- **Cloning**
- **Therapeutic Cloning**
- **Biometrics**
- **IVF**
- **Cancer**
- **Vivisection**
- **GM Crops**
- **Genetic Predisposition**
- **DNA and Personality**
- **Scientific Responsibility/Ethics**

It is readily apparent that many of these subjects overlap with Citizenship and PSHE as much as Science. Current work being undertaken in Plymouth on HIV/Aids is being seen very much in a Citizenship context.

Specific links to the GCSE Science curriculum are found within the 'Variation, Inheritance and Evolution' module, where the project can be used to explore:

- **Causes of variation**
- **Human genetics**
  - Cystic Fibrosis
  - Huntington's chorea
- **Structure of DNA**
- **Mutation**
- **Genetic engineering**
  - Benefits
  - Disadvantages
- **Cloning**
- **Selective breeding**

## 2. WHY DO IT?

According to independent evaluations:

83% of the teachers involved in SCIENCE CENTERSTAGE thought that involvement in the project had 'been beneficial to the general learning of their students'.

72% of students thought it had been specifically 'beneficial to their science learning'.

**- 'I thought all science was boring, now I don't.' (KS4 student)**

79% of the students involved in the NEWBURY SCIENCE/DRAMA FESTIVAL thought that 'drama was a suitable medium for imparting scientific information'.

90% thought they 'had learnt something'.

**- 'It was great.' (KS4 student)**

**- 'it is fair to conclude…that Newbury Science Centrestage has succeeded in engaging the public and participants that were exposed to the programme with the debates surrounding genetic science and research…overall the programme aims were achieved'. (Evaluation)**

All the teachers involved in the PLYMOUTH SCIENCE/DRAMA FESTIVAL thought the event to be 'successful' and 75% thought that their students 'had learnt a lot'.

74% of the students involved thought they had 'learnt a lot' and 67% thought that their 'attitudes to science and genetics had changed.'

**- 'I have found out a lot and it has been wicked'. (KS4 student)**

**- 'this highly accomplished piece, examining through devised drama some of the moral and ethical issues raised by biomedicine, was strengthened by the addition of much comedy, cartoon slides and a four-piece band…a thought-provoking evening'. (Plymouth Evening Herald)**

## 3. HOW IS IT DONE?

The Drama of Science is mainly aimed at Key Stage 4 students as the fit between biomedical Science and the GCSE Science curriculum is clear, as outlined in section 1. The performance skills and devising process involved also support the Drama curriculum and (as mentioned above) subject matter can also be covered by PSHE and Citizenship.

**Staff**
In order that the process is truly cross-curricular it is essential that **at least** one Science teacher and one Drama teacher are involved in the process. In many schools there have been more (up to two Drama and three Science teachers) as well as Music, English and Citizenship teachers.

**Time**
Some schools have done the entire project in out-of-school hours, a few have done all the work in school hours (especially in Specialist Col leges) but most use a mixture of lesson times/lunchtimes and after school sessions.

**Group Size**
Generally a cast size of 8 to15 has worked best, though more students can be involved technically and in other support roles. A few schools have used a whole class group; the largest cast size so far was over 40, but this was only managed by effectively splitting them into four performance groups.

**Year Group**
It should be noted that, whilst Drama of Science is primarily aimed at Year 9, a very interesting presentation on 'Designer Babies' was shown by Year 7 students at Newbury, and the Easington workshop and presentation included some pupils from Year 8. Both pilot schools chose end of Year 9 students to be involved. The 'Club PreD' presentation (concerned with DNA and personality) was undertaken by Year 12 students.

The Drama of Science process begins with an initial workshop:

## 4. WORKSHOP

An initial Science/Drama workshop is held either in individual schools (up to 30 students) or for more than one school at a central venue (15 to 20 students per school). It is led by at least one experienced Science/Drama practitioner, and can also involve a Science educationalist or similar.

The form of this workshop has been developed from the original Science Centrestage model. It was much adapted at the Newbury and Plymouth Science/Drama Festivals and further refined in the Drama of Science pilot projects.

It is now being taught to new Science/Drama practitioners involved in the Theatre of Science for use in schools in the South West.

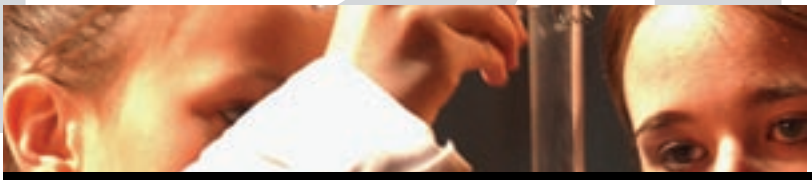
The main purpose of this initial workshop is to introduce the idea of Science and Drama working together, explore potential subject matter, look at how it is reported in the media and how it may be researched and dramatised. It aims to:

- **Focus 'applied Drama' techniques to the likely project subject(s)**
- **Provide immediately relevant scientific information**
- **Introduce definite subject areas where suitable**
- **Provide a 'taster' (and sharing) of the whole process**

The basic workshop structure is as follows (timings are approximate):

- **General warm-up for all students, teachers and scientists participating (mandatory!) – 20 mins**
- **Introductory drama techniques – 30 mins**
- **Science Input from a science educationalist (or similar) plus general discussion of the issues (probably in smaller groups) – 30 mins**
- **Science/Drama session in smaller groups: introduction of Science topics for Drama devising - 30 mins**
- **Devising of pieces based on the Science topics (in class/school groups) – 50 mins**
- **Sharing and Evaluation – 20 mins**

Total time taken = 180 minutes, i.e. 3 hours.



Three exercises that usually feature in the second section of the workshop are:

**DOUBLE HELIX** – Can we find a 'physical theatre' representation of the basic DNA structure? Various attempts at creating a model of a 'twisted ladder' (to physicalise chromosomes) have proved fun and a good way into basic genetic information.

**GIANT BODY** – Get participants to create a giant body starting with the obvious organs (heart, lung, brains etc.) but then moving on to the circulatory and other systems. This is a good way of verifying basic biological knowledge and introducing the idea of what happens if the system fails (see video).

**STATUES** – By way of preparation, ask participants to turn themselves into statues of pop stars or TV characters. Then ask them to form 'artist' and 'scientist' statues (there will usually be at least one 'mad scientist'). Follow this by getting them to say a word they associate with their statue. This is a very good way of beginning a discussion about attitudes to science (see video).

**Subject Matter**

The Wellcome Trust directs its support primarily towards work with a biomedical science link. However, the definition of 'biomedical' tends to be fairly broad. Science Centrestage saw shows about the scientist's need to communicate, schizophrenia, Humphrey Davey's 'oxygen cure', genetics and romance, 'science through the ages' and an identical twin comedy.

At Newbury we had Munchausen's Syndrome by Proxy and Plymouth saw genetic piracy in the Amazon and GM crops. The pilot projects looked at the emotional effects of cystic fibrosis (of which the Plymouth school had first hand knowledge) and biometrics (including airport security), and the BA Festival presentation took in DNA, enzymes and 'chill, thrill and love'.

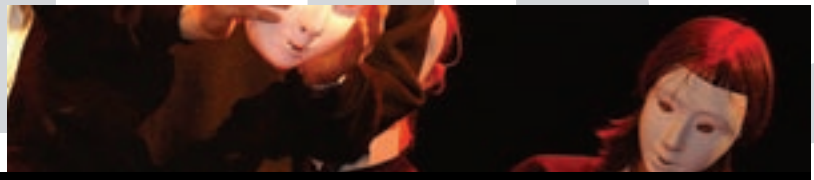
Potential subject matter for the actual production(s) can be introduced at the workshop stage. Indeed, some schools have stuck with exactly the same subject from initial workshop to final performance. Most, however, have tended do some more general research before deciding on a topic. In other cases a teacher or pupil has already had a particular biomedical interest (for example one student had a mother who was a nurse dealing with cystic fibrosis, one teacher had a relative with motor neurone disease, and one school had a lot of experience with ADHD and Ritalin).

**Audiences**

It is obviously important to consider intended and likely audiences for the final presentations at an early stage, probably as early as the initial workshop.

While some of the work thus far has been seen only by peer groups of students, most performances have been seen by wider school audiences. The festivals have been attended by wider audiences still, including parents and even 'the general public'. These various circumstances give rise to differing concerns:

- If a performance is given further life by taking it to another school, it may need to be augmented with an audience workshop to promote further dramatic and written activity.
- If tickets are available to the general public, particular attention must be given not only to the accuracy of the Science, but also to the accessibility of the shows.
- Particular care must be taken if schools and audiences may contain people directly affected by any medical issues covered.



## 5. RESEARCH

We would not presume to advise teachers and students how to research a project. However, on the internet we would initially suggest the following websites:

| | |
|---|---|
| Wellcome | www.wellcome.ac.uk |
| Bionet | www.bionetonline.org |
| BBC | www.bbc.co.uk |
| New Scientist | www.newscientist.com |
| Guardian | www.guardian.co.uk |

Medical condition specific sites can also be useful. But beware general searches – there's a lot of misleading and inaccurate information on the web.

There are many popular science books; ones we have found particularly useful are:

**'The Trouble With Science' – Robin Dunbar – Faber and Faber, ISBN 0-571-17448-5.**

**'Nature Via Nurture' – Matt Ridley – Harper, ISBN 1-84115-746-5**

**'Your Genes Unzipped' – Tim Spector – Robsen Books, ISBN 1-86105-662-1**

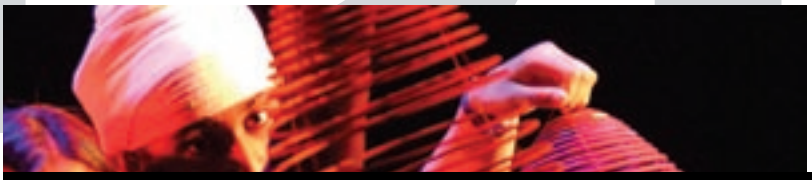
**'The Language of Genes' – Steve Jones – Flamingo, ISBN 0-00-655243-9**

**'The Odd Body' – Dr Stephen Juan – Collins, ISBN 0-00-718521-9**

**'Our Final Century' – Martin Rees – Arrow Books, ISBN 0-09-943686-8**

**'Adam's Curse' – Bryan Sykes – Corgi Books, ISBN 0-552-14989-6**

The New Scientist and Guardian 'Life' supplement are worth a look and there's always the news pages - on average a biomedical story has hit the front page at least once a fortnight over the last couple of years. Great care must be taken however with how biomedical science issues are reported. Some recent tabloid headlines have been deeply misleading and even the broadsheets tend towards the overly-dramatic when reporting such issues as 'saviour siblings'.



## OUTSIDE HELP

Getting outside, practicing scientists to input into the work in schools is of immense value. Apart from anything else it encourages the students to believe that they are dealing with 'real' science. This has been one of the biggest challenges with all the projects thus far - identifying and organising outside scientists to contribute to the development of the work. There are however organisations (especially web-based ones) that exist to support science education work:

- Local Education/Science/Business Partnerships are a good place to look for useful contacts
- Science Centres all have education/outreach departments and some, like at-Bristol, have an extensive network of science educationalists
- The Wellcome Trust website is a good access point - there is an extensive network of Wellcome-funded PhD students. People should be able to find out more about who and what the Trust has funded, and read about some of the Trust's major research initiatives at http://www.wellcome.ac.uk/fundedactivities
- Some cities (like Plymouth) also have 'Science Cafés' where the local science community congregate.
- Local hospitals may have a genetic counselling service
- Some universities (e.g. Exeter) have 'Science Communication' Departments.
- Medical Schools might also be able to help - for example, the Peninsula Medical School is a partner in the Plymouth Theatre of Science project.

Specialist Drama input may be available from local theatres or from the various Science/Drama organisations currently active (e.g. Y Touring, Tinderbox, TR2 in Plymouth )

## 6. DEVISING/WRITING

It is important that the student performers 'own' the piece. Some of the least successful work over the last three years has been imposed on the students. On the other hand, the subject area has to come from somewhere, and one person's personal passion may well enthuse others.

A student may know someone who is, or even be themselves, diagnosed as suffering from ADHD. Students or teachers may have experience of inherited disease. In these cases great care must be taken to maintain the balance between personal interest inspiring work, and the content and integrity of the final performance piece.
Some schools have separated out the writing and performance functions. In general this has not been as successful as when all parts of the process are integrated, but any group should play to its strengths.

We would strongly advise against an entirely imposed script - it almost always results in a stilted performance.


## 7. REHEARSAL

The time spent rehearsing entirely depends on how much the project is part of curriculum work, the time scale of the project and the time of year. From our experience summer term is best and about 20 to 25 hours devising and rehearsal are probably needed for a 20 minute show, depending on factors such as ability, subject and audience expectations.

Some very good work has been produced that has been almost entirely written and directed by students with only a light-touch intervention from teachers and outside specialists.

However, it is important that the scientific content is constantly monitored and, especially if a public audience are to be involved, some kind of 'show-doctoring' will often be necessary. If the project is led primarily by Science staff then extra Drama input may be required, and vice versa.

## 8. PERFORMANCE

Even if the final performance is to take place only once in one school it needs to have a sense of occasion to make the effort worth while. At the very least it is recommended that some 'outsiders' (other teachers, governors, local dignitaries etc.) are invited to attend.

The level of technical presentation will vary due to circumstance, but some form of lighting and an element of costume would seem essential. Many schools have also used digital projection of video and Powerpoint presentations, but it is important not to only 'do' the science on screen.

Some discussion of the issues raised is also essential. One exercise that is often used is a 'Line of Approval' game in which participants (and often audience members) are asked to stand in a line ranging from 'totally agree' to 'totally disagree' while biomedical ethical statements are read out. For example 'My DNA information should only be available to myself' to 'The government should have access to my DNA information' (see video).

## 9. FESTIVAL

Individual pieces of biomedical Science-based Drama may well only be presented within individual schools. However, our experience is that a wider sharing of work is beneficial both to participants and audiences. Three basic, local organisational models (other than the original Science Centrestage which had a national remit) have been tried so far:

**1. Newbury** - A 'hub school' (The Hurst School) organising a Science/Drama festival involving five other schools, in association with an outside agency (Tinderbox Consultants providing schools liaison, drama support and technical direction) and a local theatre venue (The Newbury Corn Exchange).

**2. Plymouth** – The Theatre Royal Plymouth Arts Development & Education Department and Tinderbox Consultants organising a Science/Drama festival involving four schools performing in the theatre's studio space.

**3.** One-off projects (Plymouth, Winchester and Exeter) involving the Theatre Royal Plymouth Arts Development & Education Department and/or Tinderbox Consultants organising one school's presentation either in school or in a theatre space.

**So - 'To festival or not to festival?'**

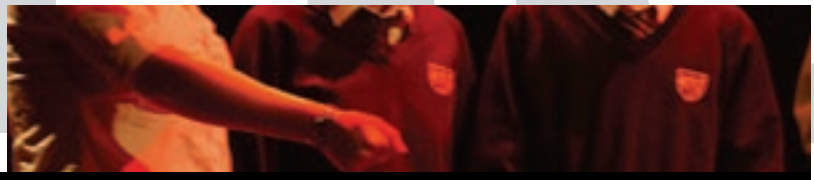
Science Centrestage was a massive undertaking. Newbury involved six schools and a performance at the Corn Exchange Theatre while Plymouth involved four schools and two performances at the Drum Theatre. The Drama of Science pilot projects performed to mixed audiences of parents, teachers, theatre professionals and other students (including American students in Winchester) and 'Club PreD' performed to teachers, scientists and scientists' children.

Easington, on the other hand, only involved two performances (and one workshop) at two schools to relatively small audiences and Imagining the Future only initially performed to an invited audience of only about 30.

A Science/Drama Festival, involving at least four schools sharing their work with each other, parents and the general public is an undertaking that has many advantages but also obvious difficulties. Let's apply a brief rough SWOT analysis:

**Strengths**

- The students have a definite 'final product' aim
- The event can be publicised and marketed to maximise impact and profile
- The event itself, given that it is presented in a known theatre space, can be presented with high technical values
- All involved should have a greater sense of achievement than if the show was only presented in the school hall



**(Potential) Weaknesses**

- Organisational matters will have to be managed well - either by the 'hub' school or whoever is putting the whole show together
- The technical liaison between shows/schools and the venue will need particular attention and a level of theatrical expertise
- There will almost certainly be transportation issues
- A competent MC will be needed to hold the event together

**Opportunities**

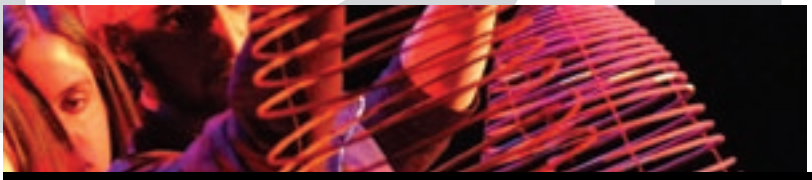
- Local education networks should be strengthened/enhanced
- Students involved should be enthused/learn something
- Teachers involved should be enthused/learn something
- The profile of the schools involved should be increased
- The audience should be entertained and better informed on the biomedical issues involved

**Threats**

- Groups may fail to produce presentable work – overall quality control may well have to be undertaken by someone
- 'Difficult' subject matter may cause problems with some audience members
- Financial control must be exercised!
- If past experience is anything to go by, people might want to do it again...

If a festival presentation of work is thought desirable then someone with organisational and theatrical skills needs to be involved and a suitable venue, with keen and efficient staff, is essential.

If a festival presentation is to be undertaken involving more than one school it is essential that the whole festival is technically rehearsed and presented, not just the individual shows, necessitating an MC, technical rehearsals etc; see section 10.



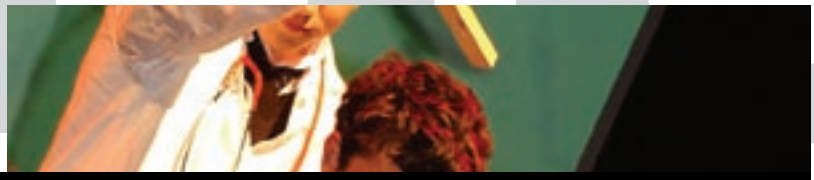
## 10. Models of Practice

There follows some edited contemporaneous workshop, school session and festival reports, written by four different observers or evaluators. It's not hard to work out which went better than others…

**Models of Good Practice**

**A. Workshop 1:**
'Huge, airy space with only 50 students participating. Six scientists involved with six Science and five Drama teachers.
The scientists get to introduce themselves and their areas of specialisation
(population, breast cancer, diseases of the respiratory tract etc.)
The teachers and scientists observe the end of the warm-up.
The 'lines of agreement' biomedical ethics exercise works well with students, teachers and scientists participating. A good discussion follows.
The devising session goes well - small groups with a lot of teacher and scientist support.
Students are really keen and work well together.
The presentations/sharing are engaging and positive with a relaxed atmosphere and good use of the space.
Good physical work, interesting subject matter and even a scientist joining in as a performer!
Good integration between the warm-up and morning drama input and the afternoon's devising.'

**B. Workshop 2:**
'Four groups were involved in this workshop: Students -Years 7-10, Teachers, Researchers (PhD - Wellcome funded) and local clinicians (and one priest).
The students all worked extremely well together. The feedback reflected that one of their favourite things about the day was 'meeting new people'.
With the exception of one science speaker, the science input was pitched at the right level and the students were interested in all the subjects that were discussed throughout the day.
Students had lively debates. I was reminded of how teenagers love dilemma (as a Drama subject/discussion topic) and appreciate their voice and opinions being heard. I felt their debates were informed and grew through contact with the researchers who also presented passionate interesting views. Most importantly, these were translated into extremely good presentations in the afternoon.
One of the great strengths of the day I felt was its structure. All activities, from the beginning, deliberately included everyone and the workshop started with large group activities and then went on to mixed school, smaller groups all of which included teachers and researchers. I am confident that this workshop will have inspired interesting pieces of theatre to be made and that we will see some great pieces presented at the festival.'



**C. School session 1:**

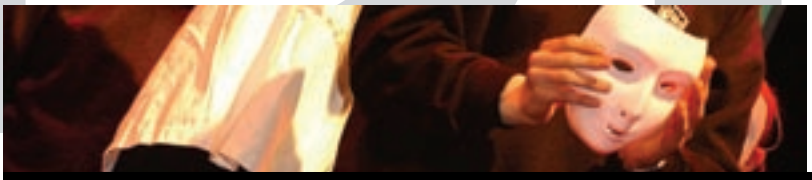
'On the first school visit it is apparent that the students are continuing with the same scenario that they started developing at their regional workshop. Seven students are involved, with one working as the effectual director.
Their project is to be their GCSE devised Drama piece.
Their Drama teacher joins them after 20 minutes or so.
They talk about 'exploring ideas about scientific research and democracy...'Is all scientific progress beneficial to the quality of human life?'
A Science teacher joins the group and says that she has videod a recent television documentary on genetics and will arrange for the students to see it.
This is apparently the second of 10 drama sessions allocated to the project before their festival presentation.
The Science teacher tells me that 'although I often do the lights' for Drama presentations that this time 'is the first I've actually worked with the kids' on a Drama project.'

**D. Presentation 1:**

'The venue is a producing theatre. Rehearsals start on time with a 'technical liaison officer' in place with three other technicians working under him.
Only five schools are involved and the MC is locally based.
The technical rehearsal goes very well, as do the presentations (even though one school was only recruited at the last minute).
Not many scientists present, but a good, mixed audience.
All the shows are presented very well, the lighting is particularly good. Some excellent singing and some good jokes plus an excellent mirror routine. (Two of the Drama teachers involved are/were professional actresses).'

**E. Presentation 2:**

'The festival took place in a studio theatre space on a specially designed space lit by the resident technician and with the use of an extremely powerful digital projector.
Technical rehearsals took place throughout the first day. Each school had 90 minutes tech time. All four schools managed a dress rehearsal.
The first night of presentations were technically fluent and well received, however, the theatre was not as full as it could have been. This was probably due to ticket allocation/box-office problems.
The second night of presentations was much better attended and received, though one school's performance did slip back somewhat.
All technical aspects of the presentations were excellently dealt with, not only by the theatre technicians but by student operators.
The festival was covered by the local press and radio.
Evaluation questionnaires were handed out on the first day and mainly returned on the second. All participating students received a certificate.
After the festival a letter was sent to the schools involved concerning the video and other feedback. All schools requested video of their own performance; two requested a copy of this evaluation report.'

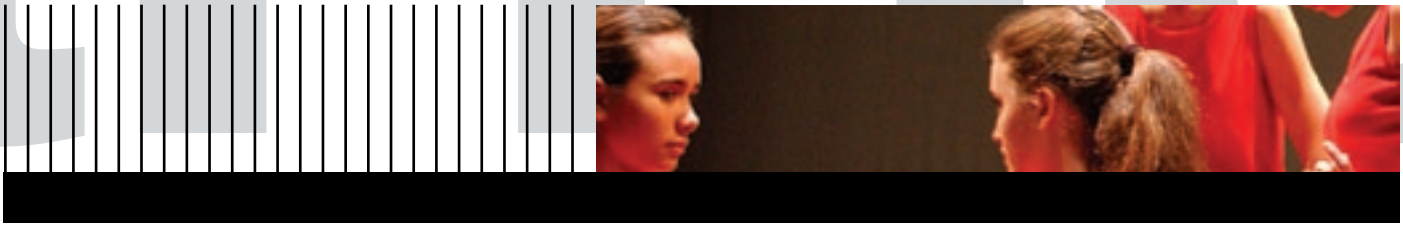


**Models of Practice to Improve On**

**F. Workshop 3:**
'The warm -up has to be split in two as no available space is big enough for the 110 students and teachers involved.
There are two special schools attending and access and signing are poor.
Student drinks are served in one of the warm-up spaces before the warm-up itself is finished.
A visually impaired group has to leave at lunchtime due to lack of consultation on transport problems.
The presentations and sharing also have to be split - one of the spaces used is a dance studio with mirrors on three sides, not large enough for the necessary audience.'

**G. School Session 2:**
Ten students are involved, all performing but not all devising/writing.
All of the work seems to be taking place out of lesson time
The session observed mainly consists of a lecture in dramaturgy (dramatic structure) with reference to two scenes written by one of the students.
A science teacher joins the session and talks about attitudes towards genetic screening etc. I'm not entirely sure that all the students fully understood what they were being told.
The writers are told to research Plato.'

**H. Presentation 3:**
'Not a performance space but a lecture theatre. Only eight lights available of which two never worked. No technician present - the first school's technical rehearsal takes place in house-lights.
The second school has a big set - half of it won't fit in the get-in lift so is abandoned.
Third school wants to use digital projection etc. A teacher tries, and largely fails, to sort out the in-house equipment.
Presentations start 15 minutes late and, due to the technical difficulties, proceedings fairly quickly grind to a halt.
However, two pieces do manage to work quite well mainly by forgetting about all of their hoped-for technical presentation. (Perhaps schools have become too reliant on computers, projection etc. but if they are to be used they must be properly supported).
No evidence of any technical (or any other?) liaison with schools.
Apparently, the event had been booked as an 'outside corporate event'.



From the above we are able produce the following check-list for a successful Science/Drama festival:

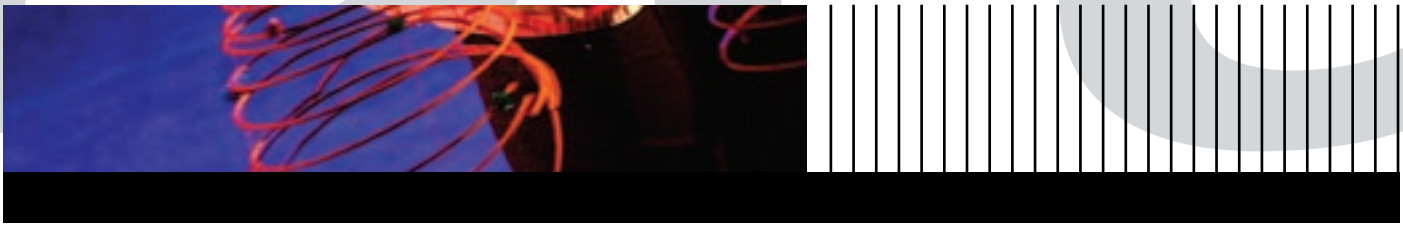
**Festival Essentials:**

- o Committed Schools - senior management, staff and pupils
- o Enough time (minimum six weeks from initial workshop to festival)
- o Publicity
- o A good, well-equipped venue
- o Good technical support/staff
- o Artistic and technical liaison between (and within) schools
- o Rehearsal time in the venue
- o A capable MC
- o A mixed audience
- o More than one performance if possible
- o Evaluation and Feedback (video is very useful) - in order that future practice may be improved

## 11. Video Examples

The video examples on the VCD are drawn from the Newbury and Plymouth Science/Drama Festivals, the two Drama of Science pilots and the Science Centrestage Festival presentations. They are intended as demonstrations of past practice and not as a definitive template for future activity. They are divided into four sections, plus comments from participants:

- o Workshop
- o Devising/Rehearsing
- o Performance in schools and the TRP Education & Production Centre
- o Festival Presentations
- o Teacher and Scientists Comment



## 12. Evaluation.

All educational projects are 'evaluated' in some way these days, to assess the impact of the work and to inform future projects. Science Centrestage and the Newbury Science/Drama Project were subject to extensive independent evaluations mainly concentrating on the effects of participation on attitudes to biomedical science.

**An extract from the Newbury Evaluation follows.**

Of the 68 student questionnaires available for analysis, the following data emerged:

o In the majority, these young respondents (aged 11-17) feel that **they are engaged in current debates around genetic research**, even stating that they do feel 'sufficiently informed'. From this study, it is not clear whether this is a result of participating in Science Centrestage, but the act of participating and filling in questionnaires is active engagement in itself.

o There is a **trend towards supporting current scientific research into genetics for the benefit of society** (a significant majority of 40 from 65)

o Rather surprisingly only 32 (from 65) thought that insurance companies should NOT have access to individual genetic information, compounded with a not insignificant nine that stated that they SHOULD. This may reflect the fact that these respondents have not yet entered the world of employment and related economic commitments and can not have a sophisticated engagement with this question.

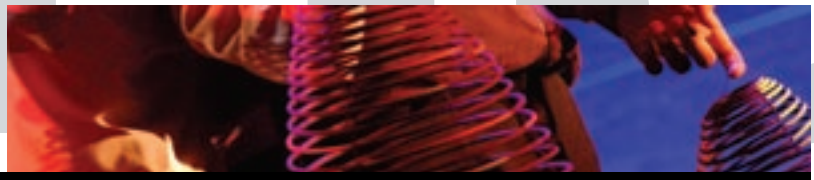
o Perhaps because of recent press coverage of stem cell research a resounding 47 (of 65) agreed that this was positive.

o When comparing answers regarding genetic testing in relation to 'designer babies' it is interesting to note that 45 respondents would be happy to use information to select the sex of a baby yet a similar number of 44 would not use this information to choose cosmetic qualities such as eye colour. With a rather surprising additional six saying that they would agree to select eye colour through genetic information gained.

o Just under one third (21 of 65) thought that genetic information should be used to aid decision-making to terminate a pregnancy showing the foetus had a disability. When compounded with just over a third (26) who were not sure, this shows a trend towards a fear and potential decisiveness to choose to eradicate genetic mutations/disabilities (only 17 said NO).

o The majority (40) showing support for gene therapy could be result of the research completed during this programme.

o **A resounding 54 thought that this type of programme (using drama as a medium of exploration and dissemination for complex scientific issues) was successful.** Perhaps this is not surprising, given that young people involved in drama activities often feel extremely positive about their work. This finding can be cross-referenced with the response of the audience who saw the productions later in this report, but again, to be tempered by the fact that all were friends or relatives, which colours the objectiveness of the viewer.



## 13. Outcome

It is hoped that this workshop, pack and video will result in more schools using drama to explore biomedical science issues and that this contributes to the very necessary informed debate that these issues will need in the 21st Century.
It is also hoped that more students and teachers will learn something and have some fun experiencing the Drama of Science. As the teacher comments on the video begin to show, many schools have already seen the benefits of using drama to explore biomedical science issues. So can yours!

**Jeff Teare**
**Tinderbox Consultants Ltd.**
**October 2004.**

**Thanks to:**
All the students and teachers who participated in the various science/drama projects referred to above. Especially –
**The three groups of students from the Ridgeway School and their teachers: Gaynor Morris, Glyn Bartlett, Simon Turley (Drama) and**
**Kevin Smallwood, Nicky Bartlett and Tim Welsh (Science).**
**The students from the Westagate School and their Head of Science, Vinnay Sharma.**
**Rebecca Gould (Associate Director TRP) - Tinderbox Consultant.**
**Simon Turley (Ridgeway School) – Drama Advisor.**
**Roger Morris (Hurst Community School, Head of Science) – Science Advisor.**
**Mel Scaffold – Editor.**

# The Drama of Science