

claybody*theatre*

EDUCATION RESOURCE PACK

# DIRTY LAUNDRY



## About this pack

We hope that teachers and students will enjoy our production and use this learning resource pack.

It may be used in advance of seeing the performance – to prepare and inform students about the play; and afterwards – to respond to the play and explore the environmental themes in more depth.

Teachers may select from the range of material, according to the interests and ability of their pupils.

The first section of this document is a detailed companion to our production: plot synopsis, who's who in the play, and interviews with cast and creatives. It reveals the ways in which our company met with the many challenges of bringing ***Dirty Laundry*** to the stage.

The second section examines the environmental themes of the play. It explains fossil fuels, and the many forms of renewable energy - specifically in relation to Stoke-on-Trent and the effects of industry on the environment and human health.



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## Introduction

The idea for **Dirty Laundry** began when someone asked playwright Deborah McAndrew if she'd ever thought about writing a play about the environment.

The science of climate change and the impact of pollution on our local and global environment is not really in question. Human activity is having a huge effect on the natural world, causing all kinds of problems. Particular issues like air quality have an impact on people's health on a local level, and the change in global temperatures is affecting sea levels and weather patterns.

So, if the science is clear, why aren't we doing more about it? The problem comes down to people. Deborah felt that the way for drama to tackle this issue was not to write about the science, but about the people; both those who are affected by the environment, and those who could do something about it, but choose not to for self-interested reasons.

Deborah decided she should write a play that works like a parable. She hopes that it will be entertaining in its own right, but also act as a kind of springboard for debate about various environmental issues.



Claybody Theatre's work is inspired by Stoke on Trent - and the 1950s seemed a good time in which to set the play. The smogs of London had finally forced the government to tackle the issue air quality, but people in Stoke had been dying of industrial lung disease for over a century. The upcoming Clean Air Act was going to impact on the pottery industry more than any other.

Both Deborah and the director of the play, Conrad Nelson, feel passionately about the environment. They believe that Stoke-on-Trent, with its roots in the Industrial Revolution, is the perfect place to explore the big questions facing all of us about our environment today.

## **SECTION 1**

### **OUR PLAY**

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#### **Characters**

##### **Nora Moth**

Nora is 20 years old. She works as a sponger and fettler at Warham's Pottery. Her mother died when she was born, and her dad, Reuben, raised her on his own. Reuben has developed a disease called silicosis from working in the pottery. He is too ill to work now, and Nora is looking after him and supporting him with her wage.



##### **Frances Berry**

Frances is Nora's neighbor. She's got grown up children, and grandchildren too – and is a bit of gossip. Reuben is an old friend of hers. She supports Nora as best she can, though they don't always see eye to eye.

##### **Doctor Copper**

Doctor Copper is the local GP. He's been a practicing doctor for many years, and delivered Nora into the world the night she was born. He works very hard in a town where there are many industrial illnesses and accidents. He is kind and wise, though a bit mysterious too.



##### **Richard Warham**

Richard Warham is the owner of the pottery where Reuben worked and where Nora still does work. All his employees call him 'Mr Richard', to distinguish him from the other members of the Warham family. He's very charming and in his youth was very popular with the girls. He served in the war, which affected him, but he still has the ability to charm his way out of trouble.

##### **Councillor Headley Blythe**

Headley Blythe is local councillor for Burslem. He was friends with Richard Warham, but now there's tension between them since Blythe removed his investment in Warham's pottery. He's been very active lately in the campaign for clean air, and has ambitions to be a Member of Parliament.



## Synopsis

**The time:** Two weeks in February 1953

**The place:** The living room of a small house in Burslem, Stoke-on-Trent

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### Scene 1

*Evening*

**Frances Berry** sits knitting a dishcloth and listening to the radio in, when **Nora Moth** arrives home early and angry. She's had a row with her boyfriend, and finished with him. Having told Frances the story of her evening, Nora wonders where her dad is. Frances tells her they were playing cards and he didn't feel well. He's gone upstairs to lie down. Nora goes up to see him and discovers that he's got a very high fever. Frances says she'll go and ask her son to run for the doctor.

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### Scene 2

*Later the same evening.*

**Doctor Copper** diagnoses an infection (pneumonia) and advises Nora to keep her dad as comfortable and cool as possible. Nora wonders how she'll look after him and still go to work. Frances offers to help. Between them they can keep an eye on Reuben.



As the doctor leaves he exchanges a look with Frances. They both know it doesn't look good.

Nora thinks the world of Doctor Copper, but Frances isn't so keen as he isn't a church goer. Nora's quick temper rises, and we see that there can be tension between the two women. However, Nora doesn't want to be alone yet and Frances will stay for a cuppa.

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### Scene 3

*A few days later - evening.*

Reuben's health is deteriorating, and Nora reveals to Doctor Copper that her dad is troubled with nightmares. He keeps calling out the name

*Emeline* in his sleep. Doctor Copper doesn't know who this could be. Perhaps it's someone from Reuben's childhood.

Frances arrives with a dish of lobby for Nora.

Frances observes that Reuben's last illness is following a similar course to her own husband, Walter. Nora asks if he had nightmares. Frances remembers that just before he died Walter was troubled with guilt about his past. Nora is deterred from confiding any further in Frances by the thought that her dad may have a guilty secret.

Frances leaves, still unaware that Reuben is talking about someone called Emeline.

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#### **Scene 4**

*The following Sunday - midday.*

Nora and Frances are back from chapel. Reuben is a little brighter. Nora makes tea for them all. They gossip about the chapel and who in Burslem is getting a television in time for the Queen's Coronation. They squabble about who'll take tea up to Reuben. Frances wins, much to Nora's annoyance. While Frances is upstairs there's a knock at the door...

It's **Richard Warham** - the owner of the potbank where Reuben worked all his life, and where Nora still does. He has come to pay his respects. It's very unusual for the boss to call, and Nora feels very awkward.

Frances comes back downstairs, and is flustered by the presence of Richard Warham - he was a ladies' man in his youth. When Warham goes upstairs to see Reuben, Nora teases Frances about having a crush on 'Mr Richard'. This annoys Frances. Once again the relationship between the women is tetchy. When Warham comes back down, Frances makes a quick exit.

Warham is sympathetic. He asks about Reuben's nightmares agrees with the Doctor's explanation about Emeline - a childhood friend. He advises Nora not to say anything about the nightmares, as people talk. He asks to be kept informed, and if anyone else visits Reuben Moth.



## **Scene 5**

*A few days later – late morning.*

Frances is sitting with Reuben while Nora is at work. The Doctor arrives on his rounds, and she tells him that Reuben had a bad night and has only just gone off to sleep.

They talk about Reuben's past and Nora's mother, Lucy. On the question of an afterlife they have differences of belief, but the argument is interrupted by a knock at the door.

It's **Councillor Headley Blythe** – come to pay his respects. Frances is suspicious. Headley Blythe is an important man with no connection to Reuben Moth. Doctor Copper is rattled by Blythe's appearance and tries to get rid of Frances. She is reluctant to go, but with the doctor there, she can return to her own chores.

The doctor questions Blythe about the purpose and wisdom of his visit. Blythe plays dumb. He's calling on a potential constituent. Following the recent death of the local MP, there will be a by-election. Blythe is bidding for his party's candidacy. Blythe has been very engaged lately in the campaign for the Clean Air Act and perhaps Reuben may find comfort in knowing that there will be a cleaner environment for Nora and her children.

Blythe denies that he's been talking to Richard Warham. They are not on good terms since he withdrew his investment in Warham's pottery.

Copper infers that seeing Blythe might make Reuben's nightmares worse, and the councillor takes the hint and leaves.

Doctor Copper is left alone to see his patient.

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## **Scene 6**

*The next morning – early.*

Nora is preparing to go to work when Doctor Copper arrives. She has hung some washing out in the morning dark. It's mild and the forecast is for a fine day.

The doctor has called to apologise for not coming the night before. He had to attend to an injured miner and then a woman in labour. He still hasn't been home to bed.



Nora is weary and frightened. Her father's nightmares become more intense and terrible. Frances arrives. She's heard the weather forecast and is offering to do some washing for Nora.

Doctor Copper goes up to see Reuben and Frances asks Nora if she knows about Headley Blythe calling the previous day. Nora says he didn't. She asks Frances to call at the Chapel with a note for the Minister.



Nora dashes off to work and Doctor Copper comes back downstairs. Frances shares her growing suspicions that Richard Warham is Nora's real father. She suspects that Reuben married Nora's mother as a favour to his employer and got a promotion out of it.

Doctor Copper is disgusted by these insinuations and tells Frances to keep her mouth shut. Whatever Reuben's secret might be, he doesn't want Nora to know. Frances concedes that it may have nothing to do with Nora, but wonders what it's got to do with Warham and Blythe.

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## **Scene 7**

*That night.*

Richard Warham and Headley Blythe have both called at the house at the same time. They snipe at each other as they wait to be admitted to the sick room. Nora comes downstairs and says she will only allow one at a time round the bed.

Blythe goes up, and Warham tells Nora that that she should stay at home now to care for her dad. He's happy to pay her usual wage even though she's not coming into work. Nora doesn't want to accept this, but Warham is insistent. Nora is suspicious and asks Warham again about who Emeline could be. Warham is on the point of telling her when Blythe reappears to tell Nora that Reuben is asking for her.

Nora goes upstairs and returns to say that her dad will not see anyone else today. Both men leave, with Warham insisting that Nora remembers what he's said to her.

## **Scene 8**

*The next morning - early*

Nora is asleep at the kitchen table, when Doctor Copper lets himself in. He wakes her up tenderly and she tells him that she's been up all night. Her instant thought is that she's late for work, but then she remembers Richard Warham's offer. She doesn't disclose this reason to the doctor, but he is glad that she's decided to stay at home.

Nora tells Doctor Copper that the Minister hasn't yet been to see her dad. Reuben's nightmares are only getting worse and he is saying another name in his sleep now – Daniel Barnett.

The doctor says that Barnett is quite a common name in the Potteries. Nora has tried to ask her dad about it, but he just gets angry – and has asked that Richard Warham call again. Doctor Copper offers to leave word at Warham's house.

Nora tries to rise to make tea, but is very faint. The doctor takes over and insists she eats something. Frances arrives and is sent away for some sugar, as Nora has used up all her ration.

Nora can't help being full of admiration for Doctor Copper. She wishes there were men her own age who were like him. The doctor goes up to see Reuben and Frances returns with the sugar.

Doctor Copper comes down from seeing Reuben, who is getting weaker by the hour. He sees Nora writing a note for Warham and insists on taking it to the pottery, rather than Frances.

Doctor Copper seems to always win in the tussle with Frances for Nora's trust.

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## **Scene 9**

*That night.*

It's very late. Reuben has taken a sudden turn for the worse. It's only a matter of time now.

Everyone gathers at the house, and once Frances hears the names Emeline and Daniel Barnett the truth finally comes out.

Emeline was not a person – it was a pattern, and twenty years earlier Daniel was a poor boy who had lied about his age to get the well paid job of apprentice dipper.

Reuben had known Daniel was only 14, not 15, when he took the job; Warham's were using illegal levels of lead in their glazes; Blythe's were investors who paid Daniel's medical bills in the days before the NHS; Doctor Copper had treated Daniel, but when the boy died he colluded in the cover up by entering a false cause of death on the death certificate.

All four men were guilty and implicated.

Warham and Blythe both defend themselves. Only Copper has the decency to be ashamed. He tells Nora that it wasn't her father's fault. In the midst of all the excuses and accusations, Nora goes up to see her dad and finds him dead.

Now there is nobody left to tell the tale, Warham and Blythe set to persuading Nora and Frances to keep quiet. It's all in the past. The Clean Air Act is coming. Everything will be better in the future and there's no point destroying lives and careers to rake over this old case.

Warham puts money on the table to help with the funeral expenses and tells Nora she can continue to collect her wage from work. Blythe and Warham leave, fairly confident that things will all get swept back under the carpet.

Doctor Copper offers further assistance to Nora, but he has fallen from his pedestal and she doesn't need him any more.

Frances and Nora are let alone, to consider what they are going to do with this knowledge now they have it.



**THE END**

## MEET THE TEAM

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### **Back to the 50s**

*Designer Dawn Allsopp on how she went about recreating a 1950s living room in the Spode Works pottery site.*



### **Dawn says:**

The brief for this design was to create a very naturalistic set for a non-theatre setting. When you're working in a theatre building it can often be interesting to be more expressive and thematic in designing a world for the actors to inhabit.

It might not be so interesting to accurately recreate a 1950s house on a conventional stage, but part of the surprise of this production is that you enter what looks like a big industrial building and you are transported somewhere else in time and space. That's when realism really works well.

So, it's Nora and Reuben's house, and it's 1953. They're not rich – in fact they're quite poor – so most of their stuff would probably be from an earlier time. Most people's real houses, even today, are a mix of things that they've collected over many years.



Most things in this house would be from before the year 1953, but I did want to suggest the exact period. I've done that that with little accents of detail, in particular objects, and elements of costume.

Once I've decided on the design, and got the measurements of the space it will fit into, I make an exact scale model of the set.

The set builders make all the pieces of wall, and me and the stage management team find props and furniture, and when we all come together to put it into the space we will refer to the model to get it right.

I also draw the characters and what I want them to wear.

Costume says a lot about a character; their job, their social status, and how much money they have. This is lots of fun – especially when I get to visit the costume stores with the actors and pick out clothes for them.

The drawings are guides for the kind of thing we'll be looking for. On some shows we can make costumes which look exactly like the drawings. But for a show like this we borrow or hire most of the costumes, so it's about finding stuff that's close to the ideas I have for the characters.

Here are some pictures of a couple of the actors trying on their costumes, next to the drawings – so you can see how close we managed to get.



**Robin Simpson  
as Doctor Copper**

**Angela Bain  
as Frances**

## **CHARACTER IN DEPTH**

### **The Power of Power**

*Actor Jason Furnival tells us all about his character Councillor Headley Blythe*



Headley Blythe is a fictional character, set within a real world context.

In 1953 Albert Davies, MP for Stoke-on-Trent North, really did die on a boat en route to Jamaica. There was a by-election in March that year.

This real life event gave the writer an opportunity to put a character into the play who has political ambitions. Headley is hoping he will be his party's candidate for the vacant seat at the upcoming by-election.

It never says which political party Headley belongs to, but I have my own private ideas about that. It's important that the play doesn't get caught up in party politics, as all sides can behave badly – and the ideas in the play go beyond specific groups or factions.

Headley is wealthy and ambitious. He does care about the environment and has been supportive of the campaigns of the Stoke Central MP, Barnett Stross on behalf of the victims of industrial disease.

However, it's fair to say that Headley has also realised that energy and the environment is a hot topic, and one on which political reputations can be built. In short, gas and electricity may not just be sources of heat and light for factories and homes, but a means to political power also.

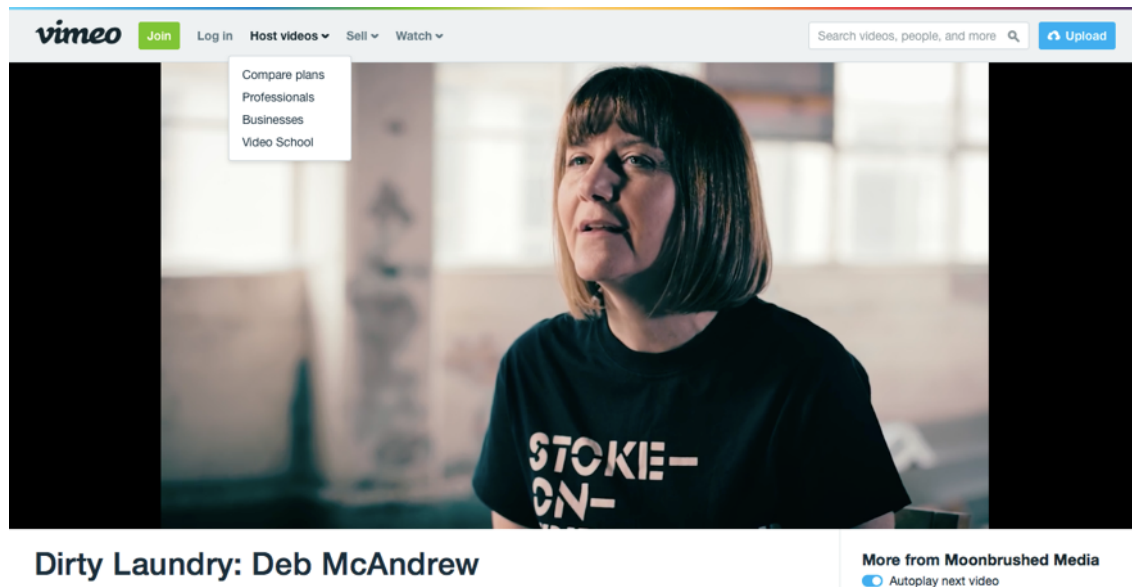
Headley Blythe, along with Richard Warham and Doctor Copper, has been involved in the cover up of the cause of a death many years before. When there is a threat that this secret might be revealed, Headley can't resist calling to see the dying man, Reuben Moth. He needs to control what's happening, as he doesn't trust Warham or Copper. Perhaps he doesn't trust anyone.

He thinks his political career is more important than justice for the boy, Daniel Barnett. He is definitely one of those men who think some people matter more than others.

## **FOLLOWING THE CLUES...**

*Click on the link below to see Deborah McAndrew talking about where she got her inspiration for Dirty Laundry, and how the process of writing this play unfolded.*

[www.vimeo.com/moonbrushed/deb](http://www.vimeo.com/moonbrushed/deb)



### **Deb says:**

The answer to all the questions related to the environment are around human behaviour...

This is great, because drama is all about human behaviour.

When I was looking for a fixed point in history in which to look at the environment, the 50s in Stoke-on-Trent was perfect.

The play centres around the keeping of a secret... a man troubled by the past.

When people start arriving who wouldn't normally come, the questions don't go away they just get bigger.

Writing drama is about following the clues.

Gradually, the characters begin to populate the space.

And the character we never meet is Reuben Moth, hovering above the action in the room upstairs... waiting to die.

## **SECTION 2**

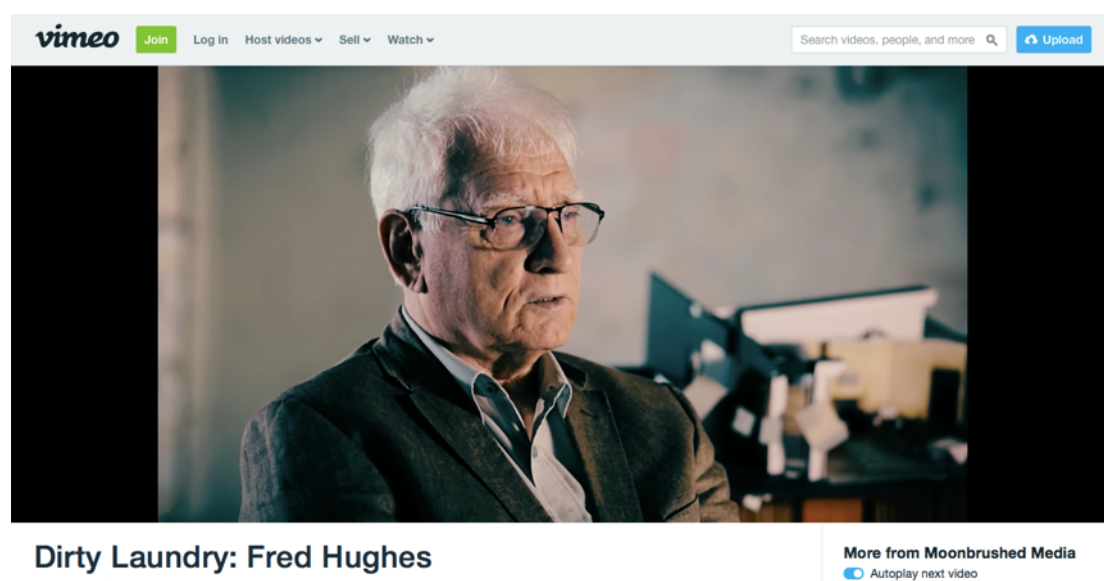
### **THE WORLD OF THE PLAY**

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#### **Stoke-On-Trent in the 1950s**

*Click on the link below to see local historian Fred Hughes remembering life in the smoke.*

<https://vimeo.com/232253749>



#### **Fred says:**

‘You couldn’t go from one end of the city to the other without being clogged up with smoke and grit...’

‘The factories were everywhere.’

‘People don’t realised how much has changed’

‘The potteries were right there.’

‘Everybody seemed to have a cough.’

‘Cleaning up the air in the 1950s was critical to cleaning up the environment.’

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## **THE CLEAN AIR ACT**



In December 1952 a dense blanket of ‘smog’ descended on the city of London.

As the word ‘smog’ suggests this was a combination natural fog and man-made smoke from coal fires, vehicles and power plants. This foul smog completely blocked out the sun and reduced visibility to just a few feet.

It was the worst air pollution crisis Britain had ever experienced and over the five days it lasted, and in the months that followed, thousands of people died and many more were made sick.

Initially the Government it was reluctant to respond due to the economic implications of restricting the burning of coal. However, the death toll had been so high that there was increasing pressure both from the public and from many MPs to do something about air pollution.

Amazingly there had been a number of initiatives in the Victorian times to regulate air pollution, and the link between air quality and human health was understood. However, it took an enormous public health disaster such as the Great Smog to finally push government into putting proper controls in place.

New measures that were written into the Act included the introduction of smoke control areas in some towns and cities, where only smokeless fuels could be burned. Grants were made available to encourage householders to convert to cleaner means of heating such as electricity and gas. The Act also included new requirements on the height of chimneys, and measures to relocate power stations away from cities.

The Clean Air Act was finally enshrined in law in July 1956. Described as 'An Act to make provision for abating the pollution of the air.'

The prohibition of dark smoke from chimneys, meant that " dark smoke could not be emitted from a chimney of any building. Anyone creating dark smoke in this way would be guilty of an offence.

Obviously, this had huge implications for Stoke-on-Trent and the bottle ovens in particular, which depended on the burning of vast amounts of coal to generate the high temperatures needed to fire pots.

Manufacturers had seven years to make provisions to fully comply with the act, so July 1962 was the deadline for the decommissioning of all the bottle ovens in the city.



The Clean Air Act changed the landscape of Stoke-on-Trent forever, and proved an important milestone in the development of a national legal framework to protect the environment.

You can find a copy of the Clean Air Act by clicking on this link:

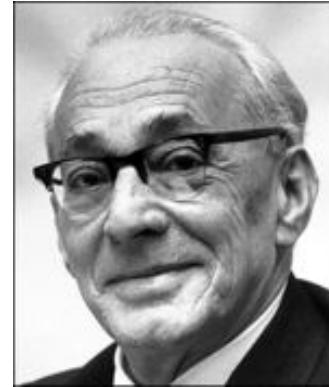
<http://www.legislation.gov.uk/ukpga/Eliz2/4-5/52/enacted>

You can find more images of the London Smog by clicking on this link:

<https://www.theguardian.com/environment/gallery/2012/dec/05/60-years-great-smog-london-in-pictures>

## **BARNETT STROSS**

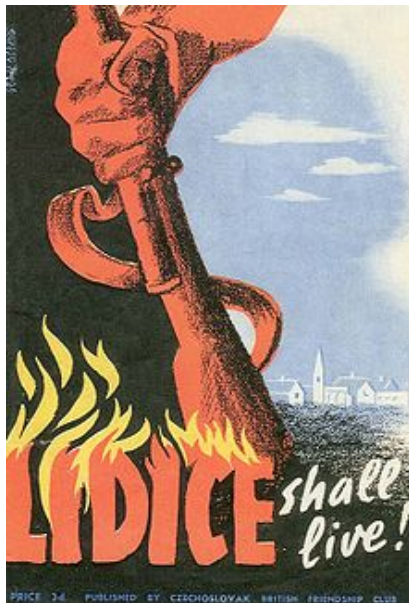
In our play the character Headley Blythe makes reference to a real person called Barnett Stross. He was an MP for Stoke-on-Trent during the time of the Clean Air Act, and was a key figure in the campaign to help workers suffering from industrial disease.



Stross was born in Poland in 1899, shortly before his family came to live in England. He was brought up and educated in Leeds, West Yorkshire, where he studied to be a doctor.

He came to the Potteries to set up his medical practice, and was moved to campaign on behalf of pottery workers and miners who suffered and died from lung diseases as a result of breathing in dust at work.

He became a member of the Labour Party in 1930 and at the 1945 general election Stross was elected as Member of Parliament for Stoke-on-Trent Hanley Division (later Stoke-on-Trent Central). He served as an MP until 1966 and received a Knighthood in 1964.



Barnett Stross not only campaigned and advised on public health matters, he was instrumental in the rebuilding of a village in Czechoslovakia that had been destroyed during the war.

Stross mobilised the miners of Stoke-on-Trent to raise funds to rebuild the small mining village of Lidice, after the Nazis destroyed it and massacred many of its inhabitants in 1942.

There are still strong links today between Lidice and Stoke-on-Trent.

Barnett Stross died in London in May 1967.

## **INDUSTRIAL DISEASE**

In Dirty Laundry, Reuben Moth is suffering from **silicosis**. This was one of many diseases that were common among workers in Stoke-on-Trent.

Industrial process of all kinds often involve workers being exposed to dust, chemicals, and other agents that impact on their health.

Emmissions, careless disposal of waste, or accidental contamination can also cause wider environmental problems too.

### **Silicosis**

A long-term lung disease caused by inhaling large amounts of crystalline silica dust, usually over many years.



When it gets into the lungs these tiny particles of dust are attacked by the body's immune system. This causes swelling and gradually leads to scarring on the delicate lung tissue.

Once the inside of the lung is scarred it can't function properly and the person is vulnerable to other infectious diseases such as pneumonia and tuberculosis.

Silica is a substance naturally found in certain types of stone, rock, sand and clay. Pottery workers, who handled clay and finely ground rocks and stones every day breathed in a lot of silica dust and were very likely to develop silicosis, and the further complications of this disease.

It was so common among ceramic workers that it is sometimes called 'Potter's Rot'.

There is no cure.

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### **Pneumoconiosis**

A similar disease to silicosis, caused by inhaling coal dust.

This disease, sometimes called 'Miner's Lung' was suffered by miners, and follows a similar pathology to silicosis.



Many miners died of pneumoconiosis in Stoke-on-Trent and all over the UK.

## **Plumbism (lead poisoning)**

It was always known that lead was hazardous to human health, but used as an ingredient in glazes it gave a whiteness and a high quality sheen and durability to the finish on ceramic objects.

For a long time Pottery manufacturers couldn't find a substitute and weren't prepared to compromise on the finish of their ware. Consequently, the workers who handled glazes, and also many of the colours used, were exposed daily to toxic levels of lead.

Those most at risk were the dippers, who immersed their hands in the glaze, and also breathed in the dusty ingredients. Because of the dangers, dippers were the highest paid workers in the factory. Measures were provided by the employers to counteract the effects of the lead, and dippers were given Epsom salts and milk to line the stomach.

In Victorian times those with a strong constitution might live to be 40, but many who were more susceptible could die within 12 months of exposure.

Women and children were more susceptible than men, and eventually in 1898 a restriction on age was introduced.

Lead tended to be absorbed into the bones from where it affected the tendons of the lower arm. This led to the potter's "dropped wrist" and in some cases "dropped ankle. It also affected the central nervous system, and could lead to paralysis or epilepsy.

Women working with lead were at risk of it affecting their unborn child; causing miscarriage and still-birth. Babies that were carried to full term by mothers suffering from lead poisoning could suffer fits, and often didn't live very long.

After long campaigning, and much resistance from manufacturers who claimed that many types of pottery products (such as sanitation ware) could not be glazed without lead, Parliament established Regulations for the Manufacture and Decoration of Pottery in January 1913.

These Regulations restricted the employment of women, young persons and children in various pottery manufacturing processes and occupations that involved the handling of lead - including dipping.

However, the 1914 - 1918 war greatly hindered the close scrutiny of the pottery industry and the enforcement of these regulations. There is evidence, both statistically and anecdotally, that manufacturers continued to use higher levels of lead for many years.

It was not until 1940 that the Chief Inspector of Factories compiled a special report on the use of lead in industry, and found that the vast majority of manufactueres were now complying with regulations. He found only four cases of lead poisoning.



You can see footage of dipping by clicking on this link:  
<https://vimeo.com/98145254>

## **THE WORLD TODAY**

**Dirty Laundry** is written to work as a kind of parable about the environment. The themes that run through our play are ones which are still relevant in today's world.

Here are some of the main themes identified:

- Air pollution
- Environmental damage
- Impact on human health
- Political interests
- Economic pressures
- Cover up

The play should make us wonder how far we've come since the 1950s and that landmark Clean Air Act.

In this section we will look at the bad news, the good news, and the breaking news...

- **The Bad News**

The human race faces its greatest challenge yet in the need to arrest climate change; to protect local green spaces, the rainforests, oceans, and delicate ecosystems - including the habitats of endangered species.

On a national and local level there is still a great deal to do to improve our environment. The biggest pollutants in the air we breathe today are Nitrogen Oxides. Some of these compounds are produced by car exhaust and are very bad for human health.

In April 2016 a committee of MPs from all the different political parties agreed that air pollution in the UK is a "public health emergency". They write a report, demanding that the government take action to tackle the crisis.

Conservative MP Neil Parish said, "poor air quality is damaging the UK's environment and harming the nation's health: emissions have declined significantly over many decades, but not far enough..."

Alan Andrews, a lawyer at ClientEarth said, "it's time for the government to act in the interests of our health. Instead, ministers are

championing weak emissions standards for cars and trying to get major air pollutants from agriculture dropped from European laws.”

A spokeswoman for the department which is responsible for air quality said that councils already have the power to charge polluting vehicles, though the government was only requiring its use in five cities.

The MPs said these powers are neither strong enough nor easy enough for local authorities to use effectively.

Diesel vehicles are the worst polluters on the roads. These amount to thousands of cars, vans and lorries. But taking 400,000 diesel cars off the road could cost the economy as much as 800 million pounds. This is a lot of money if it will only cut diesel emissions by 3%.

The MPs’ report also said farmers must act to cut pollution. A separate study found that the air pollution from farms reacts with traffic fumes in cities to produce tiny particles that have a serious impact on human health.

The MPs report was very critical of government efforts. It said that despite mounting evidence of the costly health and environmental impacts of air pollution, there was little evidence of a cohesive plan.

It also said that the government group tasked with co-ordinating efforts to tackle air pollution was seen as “secretive”.

Friends of the Earth campaigner, Jenny Bates, said: “Dirty air is already the nation’s biggest killer after smoking. The solutions are out there but we need the government to... take more urgent action now.”

In this story, just as in our play, can you identify these factors at work:

- Environmental damage
- Effect on human health
- Political interests
- Economic pressure



Compare this picture of London last year with the one on page 17 of 1952.

Are they very different?

Source: <https://www.theguardian.com/environment/2016/apr/27/uk-air-pollution-public-health-emergency-crisis-diesel-cars>



## **Cover-up**

A cover-up is what happens when people have done something they shouldn't have and they try to stop it being found out.

The 'secret' in **Dirty Laundry** centres around the cover-up of a boy's death.

In the story this boy, called Daniel Barnett, worked as a dipper in Richard Warham's factory – dipping the pots into the glaze that would give them a shiny, waterproof finish.

The glaze he was working with contained illegal levels of lead, which is poisonous. Daniel died of lead poisoning, and it was also discovered that he was underage to be working as a dipper in the first place.

Between them, Richard Warham, Headley Blythe and Doctor Copper covered up the cause of Daniel's death.

Here's an example of a recent real life cover-up...

## **The Volkswagen Emissions Scandal**

In 2015 it was discovered that the car maker Volkswagen had been cheating in emission tests by making its cars appear far less polluting than they are.

The computer software in Volkswagen diesel cars contained programme called a "defeat device". This let the car know when it was under test conditions for emissions of pollutants – particularly Nitrogen Oxides. The car then switched to a mode that reduced these emissions.

Under normal road conditions the performance of the cars would be affected by anti-pollution measures, and so when they were not being tested these measures would not work in the same way.

The US Environmental Protection Agency discovered that nearly half a million Volkswagen diesel cars on American roads were emitting up to 40 times more toxic fumes than permitted.

Volkswagen has since admitted that this cheat affects 11m cars worldwide.

Volkswagen became the target of investigations in many countries, and the company's stock price fell in value by a third in the days immediately after the news.

Top executives of the company resigned, or were suspended.

The scandal raised awareness over the higher levels of pollution being emitted by all vehicles built by a wide range of car makers, which under real world driving conditions are prone to exceed legal emission limits.

In January 2017, Volkswagen agreed to plead guilty to criminal charges and signed up to an agreed Statement of Facts. The statement set out how engineers had developed the defeat devices because diesel models could not pass US emissions tests without them. Having designed and fitted the software into cars they then deliberately sought to conceal their use.

On 21 April 2017, a US federal judge ordered Volkswagen to pay a \$2.8 billion criminal fine for rigging diesel-powered vehicles to cheat on government emissions tests.



You can read more about the Volkswagen Emissions Scandal here:

<https://www.theguardian.com/business/ng-interactive/2015/sep/23/volkswagen-emissions-scandal-explained-diesel-cars>

[https://en.wikipedia.org/wiki/Volkswagen\\_emissions\\_scandal](https://en.wikipedia.org/wiki/Volkswagen_emissions_scandal)

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**But it's not all doom and gloom...**

- **THE GOOD NEWS**

In the UK and all around the world we are developing ways to power our modern lives that don't have a destructive effect on the earth, the oceans and the air we breathe.

**These sources of energy are called RENEWABLES - or alternative, sustainable or green energy**

For at the least the last hundred years the "western world", our part of the world, has been powered by fossil fuels.

Fossil fuels like coal, oil, and natural gas come from deep in the ground and under the sea bed. They were made over hundreds of millions of years from the remains of plants and animals.



These fuels heat our homes, cook our food, make electricity, run our cars, fire our pots and generally make our lives easier and more fun.

Without fossil fuels our lives would be very hard - as hard as the lives of billions of people who live in parts of Africa, Asia and elsewhere who cannot afford to buy fossil fuels. Like them we would have to burn wood and animal dung to cook our food and to keep warm.

Fossil fuels are a brilliant resource - easy to use and, until recently, plentiful. The problem with them is that you have to "burn" them to get at their energy, and burning them makes substances that are bad for people and bad for the world. The worst of these substances is a gas called carbon dioxide. Carbon dioxide mixes into the air and works like a blanket holding in heat and making the world heat up.

This sounds like a good thing, there are times when we would all like to be warmer. But heating up the whole atmosphere (global warming) makes the weather wilder - think of the devastating hurricanes that happen more & more each year in the Caribbean, Central America and the southern USA.

Global warming also makes huge amounts of ice at the north and south poles melt. The melt waters raise the level of the sea, and large areas of land will permanently flood - some countries like Bangladesh will disappear completely.

Some of the other waste products that are made when we burn fossil fuels are poisonous and can cause people to become ill. These harmful things are made in particular when we drive our cars and lorries.

Overall things are getting better. Before the middle of the 20th century, and at the time of the play, Dirty Laundry, the air was made black with soot from burning coal, especially in industrial areas, and people were made sick as a result of sulphur compounds given off when coal burned.

The burning of fossil fuels is THE major global pollutant -

- producing carbon dioxide that causes global warming;
- emitting sulphur and nitrogen oxides, and particulates that cause ill health and environmental damage

Fossil fuels are running out - they take hundreds of millions of years to make (they are not renewable!), and new sources are increasingly difficult to find and win.

**We have to find other ways of getting energy so that we can use much less fossil fuel.**

People have been getting small amounts of energy, without burning fossil fuels, for thousands of years.

Windmills captured energy from moving air to grind grain into flour or to pump water, and water wheels took energy from flowing water in rivers and streams to help grind grain, break rocks and make paper.

We can learn from this history and use modern technology to capture energy directly from the environment. This is renewable energy. These are some of the technologies that are most likely to contribute to meeting our energy needs.

**Wind energy** - huge modern windmills, called wind turbines, make electricity. In many places around the UK wind farms with dozens of wind turbines have been, and are being, built.

Most wind farms are just off the coast, in the sea, where the wind is stronger and more reliable. Denmark now generates nearly half of its electricity from wind power, and the UK has at least that potential. The UK currently has the three largest offshore wind farms in the world, and is building more.



*Offshore wind-farm - Denmark*

**Hydro-power** - The power of moving water is used to make electricity particularly in Scotland. However the number of places you can put water turbines is quite limited.

Mountainous areas with large rainfall are most suitable for hydroelectric plant.



*Hydro-electric plant (including pumped-storage)  
Wales*

**Solar power** - the direct power of the sun - solar power is very widely available. Wherever the sun falls, solar panels can be placed to capture the sun's rays and convert them into electricity.

This form of energy capture works best in very sunny places, but still works well enough in the UK for it to be worth many people installing solar panels, often on the roofs of houses. On some days in March 2017 solar panels produced six times as much electricity as was produced by coal-fired power stations in the UK.



*Array of solar panels on a rooftop - Hong Kong*

**Wave energy** - Wave energy is difficult to capture - the sea can be a very violent place and making wave capture devices that work in all sea conditions, and which aren't damaged during storms is very difficult. At present hardly any energy is taken from waves, but many engineers are optimistic that we will solve the technical challenges that will help us tap this potentially massive source of energy.



*Experimental wave capture device*

**Geothermal energy** - Geothermal energy is heat that comes from the earth's core. In many places in the world - Iceland for example - this heat comes close to the surface and can be captured and used to heat buildings and generate electricity.

At present the use of geothermal energy is limited to those countries that have surface resources (on tectonic plate boundaries) but by drilling deep it may be possible to capture elsewhere.



*Geothermal plant - Iceland*

**Bio-energy** - in some parts of the world we can grow plants that can be harvested to make fuel. We have of course been using wood to burn for heat for thousands of years, but trees take years to grow, and wood burning is not sustainable.

We have recently started to grow other fast-growing crops - bamboo, corn, sugarcane etc - to produce liquid fuel. It also possible to use waste including human sewage to produce gas that can be burned.



*A sugar/ethanol plant in Brazil*

**Nuclear energy** - comes in two forms - one of which - fission power (produced by splitting atoms) has been making a contribution to the UK's electricity production since the 1950s - it is a reliable, providing electricity day and night.

However, many people believe the radiation/ radioactivity that come with fission power make it too dangerous to continue using. Also, the cost of nuclear power is high, perhaps twice the cost of that captured by offshore wind power.

The second type of nuclear power is made when atoms of hydrogen are "fused" or joined together. So called fusion power doesn't produce any useful power at the moment - there are many technical difficulties that need to be solved - and it won't be making any significant contribution to our energy needs for at least 20 years. Long-term it may be the dominant means of energy production.



*Nuclear power station - Germany*

## **Using available energy better**

### **Energy storage**

Of course, the sun doesn't shine, and the wind doesn't blow, all the time; the tide ebbs and flows, and varies a lot with the season, and plants have a limited growing season. We have to find clever ways to bridge the gaps in the supply of renewable energies.

One way to bridge the gap would be to store energy by using batteries. Batteries have got hugely better over the last few decades and it is now realistic to use them in our homes, cars and factories storing electricity to see us through dark nights, long journeys and calm weather. There are some other energy storage technologies available but it is unlikely that they will have any significant impact in the near future.

### **Efficiency and conservation**

Renewable energies are not the whole answer. We also need to get better at using the energy that we have.

Cars use much less fuel now than they did 40 years ago, about one third the amount. The average light bulb uses around one tenth what it did 20 years ago.

Our homes used to leak heat like a sieve - houses built now need very little energy to keep us warm and comfortable. We are improving energy efficiency continually, but changes take time to have an effect as we: replace older cars, build new houses and change our behaviour.

One of the challenges we still have to face is our addiction to flying - air travel is very energy intensive and is entirely dependent on fossil fuels. About one tenth of oil production goes to fuel planes and this only seems likely to increase as people in China, India and other countries become better off.

**It is essential that we develop every cost effective, non-polluting and sustainable energy source if we want to still have sophisticated chemicals, healthy bodies and a healthy planet.**

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- **Breaking news...**

As we are rehearsing our play, there is some great news for our Stoke-on-Trent, as a city committed to renewable sources of energy.

Over the past three centuries the miners of Stoke-on-Trent could tell you how hot it is underground, and now work is now beginning on a £52 million district heat network - tapping into geothermal resources beneath the city.



Stoke-on-Trent City Council has received almost 20 million pounds in funding from the government to develop this project, which will make a positive difference in reducing our environmental impact and creating sustainable energy for generations to come.



You can read more about this amazing initiative for Stoke-on-Trent here: <http://www.stokesentinel.co.uk/news/stoke-on-trent-news/work-starts-citys-52-million-549277>

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### **Credits and additional links to further reading**

Clean Air Act

<http://www.history.com/news/the-killer-fog-that-blanketed-london-60-years-ago>

<http://bottleoven.blogspot.co.uk/p/1964-potteries-progression-to-cleaner.html>

London's smoggy skyline seen from Richmond park, January 2016.  
Photograph: Gill Allen/REX/Shutterstock

Barnett Stross

<https://barnettstrossfoundation.wordpress.com>

[https://en.wikipedia.org/wiki/Barnett\\_Stross](https://en.wikipedia.org/wiki/Barnett_Stross)

Industrial Disease

<http://www.nhs.uk/conditions/Silicosis/Pages/Introduction.aspx>

<http://www.thepotteries.org/jobs/dipping.htm>

<http://oem.bmj.com/content/oemed/20/3/169.full.pdf>

<http://potbankdictionary.blogspot.co.uk/p/d.html>

Air Pollution

<https://www.theguardian.com/environment/2016/nov/02/high-court-rules-uk-government-plans-to-tackle-air-pollution-are-illegal>

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