

## A tale of two cultures

By Toss Gascoigne and Jenni Metcalfe

Narrator	<p>It's 7 May 1959 CP Snow, or Sir Charles Percy Snow to his friends, is in Cambridge in England. It's a misty atmospheric night. The spires of Cambridge disappear into the night sky, and the air is full of the muffled clanking and whirring of thousands of bicycles.</p> <p>Snow has long been troubled by a growing gulf between science and the people running the country, the politicians, lawyers and senior bureaucrats. These people come substantially from a humanities background.</p> <p>They are, feels Snow, richly contemptuous of their scientific colleagues.</p> <p>Snow is in Cambridge to deliver the Rede Lecture, a prestigious annual lecture given at Cambridge University. They began in 1859 and continue today.</p>
Snow	<p>They're an arrogant lot, those people from Humanities, full of their studies of Greek and Latin, and stories of Shakespeare.</p> <p>A good many times I have been present at gatherings of people who, by the standards of the traditional culture, are thought highly educated and who have with considerable gusto been expressing their incredulity at the illiteracy of scientists. Once or twice I have been provoked and have asked the company how many of them could describe the <a href="#">Second Law of Thermodynamics</a>.</p> <p>The response was cold: it was also negative. Yet I was asking something which is the scientific equivalent of: Have you read a work of <a href="#">Shakespeare's</a>?<sup>1</sup></p>
Narrator	<p>Something wrong, old chap? You sound quite emotional</p>
Snow	<p>It's arrogance! Over-confidence!!</p> <p>What makes them think that they can move England into the modern world, where science and technology are going to transform the way we live?</p> <p>And they have the temerity to criticise us, the scientists of Britain! Uncultured, they say! Unsophisticated!</p> <p>Just because they think we don't speak the same language, quote poetry and recognise all the literature references.</p>

	<p>Ignorant! Uncultured!! Poppycock!</p> <p>We're missing out - Britain is missing out! - because of the arrogance and ignorance of these people</p> <p>But this time they've provoked me too far.....</p>
Enter group of bureaucrats	<i>(Chatting to themselves in upper class English voices – lots of 'Dear Boy' and "I say old chap" and 'Oh yes, rather.')</i>
Snow	<i>(Interrupting)</i> I say, <i>chaps (ironic emphasis)</i> , you seem a little down on science and us scientists. Don't you think we play a role .... Isn't science the real hope of the future?
Bureaucrat 2	Ah Sir Charles. How are you, old chap?
Bureaucrat 1.	Dear boy <i>(looks down nose)</i> – “Hope of the Future?” Well of course, you would say that, wouldn't you? You ARE one of them.  <i>[Aside to colleagues]</i> Scientists...such uncultivated people, no sense of the rich tapestry of English literature and culture. Lacking subtlety and nuance, don't you think? They speak in tongues, got their own private language. Impossible!
Bureaucrat 2	Ah CP, now don't synthesize anything I wouldn't synthesize now? <i>[Sniggers to friends]</i>
Bureaucrats	<i>(Titter)</i> Jolly well said, old chap
Bureaucrat 1	<i>(Turns to others)</i> Have you caught up with Marlowe's play at the Old Vic Theatre? Such an interesting contrast with Shakespeare's approach, such insights! I pity anyone who hasn't caught it.... <i>(Group begins to walk off)</i>
Snow	Wait! Stop! <i>(Bureaucrats turn to face him)</i> Isn't this a bit short sighted? Aren't you in danger of turning your back on the modern world? Ignoring the 20 <sup>th</sup> century? Not recognising it belongs to science? That the way to lift people out of poverty, create jobs, improve the lives of ordinary people is going to be through scientific advances?
Bureaucrats	<i>(Titter among themselves.)</i> 'Oh dear boy'
Bureaucrat	Dear boy! Sir Charles...

1	Everyone knows the best people to handle the affairs of the nation are those with a classical education. Greek and Latin – if one is trained in Greek and Latin, one can solve <i>any</i> administrative problem.  Technical training? From technical colleges? Oh dear no! So limiting, so insular. Grime under the finger nails....
Snow	So you're critical of scientists because they can't discuss the differences between two 16 <sup>th</sup> century playwrights, and they don't always understand the Latin and Greek tags you drop into conversation: <i>De Mortuis Nil Nisi Bonum, Ex Tempore, Flagrante Delicto</i> .....
Bureaucrat 1	Well frankly, dear boy, since you put it so bluntly ...
Snow	Is that really very important? To know what dead playwrights said about an old world?
Bureaucrats	<i>(Titter among themselves.)</i> 'Goodness me!'
Snow	Well let me test you
Bureaucrat 2	Test? Us?
Snow	Well here you go. Tell me the Second Law of Thermodynamics
Bureaucrats	<i>(Silence. Look at each other.)</i>
Snow	It's fundamental
Bureaucrat 1	<i>(Talking among themselves)</i> What's he's talking about?
Bureaucrat 2	<i>(Talking among themselves)</i> I haven't the faintest idea.
Bureaucrat 3	<i>(Talking among themselves)</i> Oh these scientists. We never talk to them
Snow	It's like asking a grown person if they can read. Or not.  You'd be ashamed of having to admit you can't read, wouldn't you?
Bureaucrats	<i>(Silence. Look among themselves. Start to mutter about how useless science is.)</i>
Snow	A hint. It's about entropy – and that's a good Greek word for you, from entropia....
Bureaucrats	<i>(Muttering to each other while Snow looks on with hands on hips looking exasperated. He turns to the narrator and raises his hands,</i>

	<i>giving up.)</i>
Narrator	<p><i>(Turns to audience)</i> Who can help?</p> <p>Who can tell us the Second Law of Thermodynamics? Explain what it means?</p> <p><i>(Selects member of audience)</i> What about you Sir? You, Madam? Any volunteers? It's the science equivalent of being able to read, after all ... <i>(Assuming volunteer)</i> Ah, here, come up the front...</p> <p>And your name is .....</p> <p><i>[Volunteer probably stumbles through complex explanation, ad lib with Narrator, thanks volunteer big round of applause]</i></p> <p>Perhaps a second volunteer? <i>(Same conversation)</i></p> <p>That wasn't very clear, was it? Actually pretty hopeless, I thought. Perhaps Charles Percy Snow was aiming too high.... But I can help, through my talented friends Flanders and Swan.</p> <p>F &amp; S, as we all called them, were a pair of British music hall showmen. Wonderfully talented, tackled all the hard issues. A bit like the British version of Tom Lehrer....You DO know Tom Lehrer, don't you? MIT mathematician? Sang about Boy Scouts, and then his famous song of the Periodic Table? Brian Trench is a BIG fan <i>(This last line will need to be tailored for local audiences)</i></p> <p>No? Oh dear. Well, let me educate you a little with Flanders and Swan, both culturally and scientifically, given you all failed so lamentably in your explanation of the Second Law of Thermodynamics...</p>
	<p><i>Play Youtube: Start at 1.32 seconds</i>  <a href="https://www.youtube.com/watch?v=VnbiVw_1FNs">https://www.youtube.com/watch?v=VnbiVw_1FNs</a></p>
Bureaucrats	<i>(Move off to one side of stage, in group)</i>
Narrator	<p>Good! I guess we're all in the picture.</p> <p>Now, CP – may I call you CP? No? You prefer Sir Charles? Or Percy? Come and sit down here – I want to ask you some questions.</p> <p>So there's this gulf between the two sides?</p>
Snow	Yes, impossible to bridge it would seem. Humanities chaps simply don't respect science. Or scientists. Think we're completely

	beyond the pale. Uncivilised.  It wouldn't be a problem – except they're in charge....
Narrator	In charge? Of what? What do you mean?
Snow	Of everything, my dear. Well, everything that counts. All the Government Departments. Ministers and so on. There's this quaint idea in Britain that any person can run anything, as long as they've mastered the classics. Greek and Latin, you know, that sort of stuff.
Bureaucrats	<i>(Mutter variously)</i> Yes? What's wrong with that? Seems obvious to me. What is this fellow on about? It's fundamental, really.....
Narrator	But ... but
Snow	Yes, yes, I know what you're going to say. I've been saying it for years. We're heading into a science age, where science is more important than ever
Narrator	So – there's a gap? A knowledge gap? How do we bridge it?
Snow	We could start by taking all these arrogant humanities types out and shooting them. Except I quite like some of them, insufferable as they are... Married to one of them, as a matter of fact.
Narrator	Just a minute. You! Yes, you! <i>(points to bureaucrat)</i> The one in the <i>(describes dress/shirt)</i>
Bureaucrat 1	Me? <i>(Points to self)</i>
Narrator	Yes <i>(impatiently)</i> Over here please. Sit. Next to the great man CP himself.  So what are your ideas?
Bureaucrat 1	Well I think the country is in perfectly good hands. We're doing quite nicely, thank you.  And those scientists. I had dinner with some the other night, in college. Tried to strike up a conversation – and they just GRUNTED! I mean, really! Just grunted. There's no getting polite conversation out of them
CP	But how much of an effort did you really make? I mean, <b>really</b> make? Did you try to stretch out? Did you look for the beauty in mathematics? The symmetry of science?
Bureaucrat 1	Beauty in mathematics! What an extraordinary thing to say! Beauty! Beauty lies in a sonnet. Or is a legal judgement. The

	glorious history of the British Isles. The stories of the Empire. Courage! Bravado! Enterprise
CP	All those things are in science, too, if only you'd look. You have to make an effort You people think you're the only intellectuals around.
Bureaucrat 1	But science – I mean, it's so limited.  You think you have all the solutions.... Sounds to me you're promising Nirvana! Utopia! The promised Land! That science and mathematics is the one true path. Ramming your ideas down our throats.  The only way to deal with issues is through is by discussion. Applying the first principles of good government. The Greeks thought of it first, and I see us as carrying on their good work.
CP	So life's a struggle and we have to sit back and endure it!  Science can improve things, but we need to understand its power. And its limitations – can't do everything. If we work at it we can improve life, and create jobs and solve problems and become wealthier. But not if you shut your ears to science.....
Bureaucrats	<i>(All talk at once saying things like)</i> "What ridiculous optimism..." "You can't possible understand the human soul..." "Huh, you scientists just create problems..."
Narrator	Stop! Stop! Stop this wrangling  We seem to have reached an impasse.  Can the two sides ever talk to each other, or is the world growing further apart?  Is there any hope, or are we doomed to pass like ships in the night, neither recognising nor understanding the other side?  Is there no hope?  <i>(Moves into audience, selects a victim)</i>  You sir. Can you see a way out of the wilderness? Perhaps the situation calls for a special interpreter? Someone to help bridge the gap? Allow science to talk to the others in our society?  What might such a person do? What might they be called?

	<i>(Response)</i>
Narrator	What might such a person be called? A science communicator, you say?  <i>(Selects another victim)</i> And what about you madam?
	<i>(Response)</i>
Narrator	What about you others? <i>(Opens up to other audience contributions)</i>
	<i>(Responses)</i>
Narrator	<i>(To Bureaucrat 1)</i> What do you think? Could it work? Could this be the start of a new dialogue? A new hope? Open discussions drawing on the strengths of the natural sciences, the humanities and the social sciences?  A new field of study – even a new discipline?  What do you think?
Bureaucrat 1	Perhaps - just perhaps – I’m beginning to reconsider this....  Perhaps someone to <i>interpret</i> might <i>almost</i> be useful [voice trails away] . A boundary spanner? Someone to bridge the cultures, interpret...
Narrator	What do your colleagues think?
Bureaucrat 1	<i>[Grudgingly, after consultation with other bureaucrats]</i> We think there might be a MINOR role
Narrator	<i>(Turns, walks towards audience)</i> And so ends Act 1 Act 2 sees the rise of science communication, discussions and debates around deficit, dialogue, participation, engagement...  It covers the rise of the giants in the science communication space... Brian Trench, Martin Bauer, Bernard Schiele, Bruce Lewenstein, John Durant, Dominique Brossad, Dietram Scheufle, Massimiano Bucchi, Toss Gascoigne ... oops, no not him. (Add or delete names to suit audience and best to choose someone who is in the audience)  New science communication courses emerge, led by the doers and thankers: Lloyd Davis, Alex Gerber, Joan Leach, Luisa Massarani, Marina Joubert, Gultekin Cakmakci (Add or delete names to suit audience and best to choose someone who is in the audience))  Oh! Some of the giants are in the room! How fortunate!  Perhaps a comment? <i>(Choose one of the named people who is</i>

*likely to be highly embarrassed, will mumble something)*

*(Narrator thanks named person/persons, then turns to address audience)*

Thus ends Act 2.

Act 3 – now that’s a problem. How will it all end? Our playwrights are stumped, caught between two possibilities. The big question: does Act 3 resolve the conflict that CP identified all those years ago?

Let me look into the future.

It could end well. The world tunes in to science, discusses possible applications, uses science wisely, The problems of the world still exist, but are discussed and possibly resolved in a calm and rational manner..... Utopia? Not quite, but....

Or it could end badly.

The discussion stalls. People shout at each other from the hilltops. No problems are sorted out. The divisions grow wider. CP Snow’s worst nightmares come true.

The authors are in a dilemma. How should the play end? With the struggles, the warfare continuing?

Or do we reach a state of calm? Utopia, let me call it. Let me consult.....

Audience: how should Act 3 end? No, not so eager – wait! You all get a chance to vote.

Here are your instructions:

If you think it ends in utopia – open your arms like this; show the love. *(Demonstrates: arms wide spread, palms of hands turned upward)*

If you think it ends in ongoing struggle - clench your fists ready for battle – like this. *(Demonstrates: shakes clenched fist in typical revolutionary gesture).*

OK ready – take your vote...

Ah thanks ladies and gentlemen, I see the fists have it! Come to Dunedin in 2018 to see Act 3 and how it really ends...



The play was first performed on Thursday 28 April 2016, at the Fourteenth PCST Conference in Istanbul, Turkey.

The cast in order of appearance was:

Narrator	Jenni Metcalfe
CP Snow	Fabien Medvecky
Bureaucrat 2	Lloyd Davis
Bureaucrat 1	Michelle Riedlinger
Other bureaucrats	Wiebke Finkler, Toss Gascoigne. Bienvenido Leon

### **Words to the Thermodynamics Song Performed by Flanders and Swann**

The First Law of Thermodynamics:

Heat is work and work is heat

Heat is work and work is heat

Very good!

The Second Law of Thermodynamics:

Heat cannot of itself pass from one body to a hotter body

(scat music starts)

Heat cannot of itself pass from one body to a hotter body

Heat won't pass from a cooler to a hotter

Heat won't pass from a cooler to a hotter

You can try it if you like but you far better notter

You can try it if you like but you far better notter

'Cos the cold in the cooler with get hotter as a ruler

'Cos the cold in the cooler with get hotter as a ruler

'Cos the hotter body's heat will pass to the cooler

'Cos the hotter body's heat will pass to the cooler

First Law:

Heat is work and work is heat and work is heat and heat is work

Heat will pass by conduction

Heat will pass by conduction

Heat will pass by convection

Heat will pass by convection

Heat will pass by radiation

Heat will pass by radiation

And that's a physical law

Heat is work and work's a curse

And all the heat in the Universe

Is gonna coool down 'cos it can't increase

Then there'll be no more work and there'll be perfect peace

Really?

Yeah - that's entropy, man!

And all because of the Second Law of Thermodynamics, which lays down:  
That you can't pass heat from the cooler to the hotter  
Try it if you like but you far better notter  
'Cos the cold in the cooler will get hotter as a ruler  
'Cos the hotter body's heat will pass to the cooler  
Oh, you can't pass heat from the cooler to the hotter  
You can try it if you like but you'll only look a fooler  
'Cos the cold in the cooler will get hotter as a ruler  
That's a physical Law!