Plot Likelihoods

Alan Halsey

[Score commissioned by Caitlin Buck and Bo Meson for performance at the Sheffield University Festival of the Mind. The text draws on interviews in which six scientists discussed the significance of uncertainty in their disciplines and their allowance for it. The performance took place in St George's Church on 28 September 2012. The musicians were Martin Archer, Mick Beck, Hervé Perez and Johnny Hunter, with Geraldine Monk as 2nd voice.]

V, voice. M, musicians.

1st Movement

V reads solo with marked pauses between lines:

not knowing the answer before you start
to go back through time
I've got a picture here hard to measure
it depends very much on some
badly behaved errors we can't get rid of altogether
you'll find blackbirds you'll find ducks you'll find pigeons
represented visually by bands of uncertainty

numbers the code by which archaeologists
estimate calibration curves
there are only two left in a huge forest
& they never quite reach
I have no choice but to
just because the mound was there
design an experiment to test the hypothesis
do it three times & I'll start to believe it
then take it round to the stats department
to find a set of images of the same object
we can walk down the corridor & tomorrow afternoon
we know people have been living here & there on this axis
20 years 500 years
to get over the significance barrier
to save time & pain
I want you to rest easy
I make a lot of assumptions because
they can sometimes if you're lucky cut a long story short

M respond with lively improvisation which they gradually restrain into a continuous background sound for

2nd Movement

V reading, with similar line-pauses:

is it really doing what he thinks it's doing
& can he tell you what to do with it
if we built a black hole
what would the experimentalists see
if it wasn't spinning or if it was
uncertainties can vary in size
we've only had one Earth &
there will always be unknowns
let's play & draw cartoons
there's an unpredictability
a trade-off in terms of the scatter
between many assumptions & a few

making simpler or more complicated models

if nanoparticles released by catalytic clothing
do get in the water treatment plant
what will that do to
errors smaller than the points on the graph
you don't know what's going on in between
the first two or three bridges
once you've put some text in
a mathematical forest with ridges in the middle
we can reverse engineer the most likely result
where it's involved in the public realm
to work out how much I trust a singular fit
this particular parameter this inherent instability this
hardest part of the dialogue
the way ocean and climate interact
I would understand as a different simulation
male & female as conflict between pathogen & host
gene sequences long gone
the fibres are thinner than
when I say 'probably' inverted commas
'I tried that & it didn't'
most of us tend to be less explicit about the well-known
meaningless chuck-out of software in error bars
at discrete points from global down to local
it isn't an admission of failure
when you're looking at small changes in the input
variations which tend to be averaged out
solving physical equations of motion in the atmosphere
I wonder what happens if you have evidence for
but can't prove there's a near-identical corridor
in one of its 500,000 iterations produced minutes later
what if I had more money
what if they're frightened by Prince Charles
what if we add this bit of molecule to that

when the benefits outweigh the risks
you can calculate the particles emitted
blackbirds an antler-pick ducks a few pigeons

(remains of)
ensemble predictions
emergent phenotypes in nutshells
what happens first when polymers crystallise
that's a two-way street
an observation orthogonal to current understanding
this field has been in flux for the last 10 years
you have a good feeling but
cannot measure both position & momentum
at the end you can see the prediction's
a highly non-linear model you had to
change to deal with the variation
this wiggly behaviour in the distributions
the stuff has anyway
however fine your dissection of
the degree of interaction between the ice-sheets
(remains of)
you still don't know what's going on inside

Then M again break into lively improvisation which continues through

3rd Movement

in which V improvises text generated from the grids:

A. V strings these phrases together in a semblance of sense, pausing when a string leads nowhere then trying again to 'fail better':

just because they never quite reach if we built a
set of images of your dissection of
simpler or more complicated error bars you'll find
in the middle thinner than
the code by which as discrete points from the significance barrier
as conflict between not knowing the
errors smaller than inverted commas produced minutes later
represented visually by emergent phenotypes
a singular fit in the distributions of the scatter
in flux for the to be averaged out

depends very much on the most likely assumptions because
if I had more to go back through
this inherent you can calculate the an experiment to test
what happens first as a different simulation
less explicit than what happens if we can't get rid of
small changes in the physical equations of
highly non-linear calibration curves can vary in size
on this axis (remains of)
it wasn't spinning or if we add this at the end you
have no choice but do it three times
& it didn't prove there's a can he tell you what
an admission of the risks
orthogonal to current where it's involved in (remains of)
interaction between there will always be

B. in which V is joined by a 2nd voice but neither is foregrounded – these words are just another sound in the mix, delivered in bursts with marked pauses. M play in a similar manner:

curves deal work stuff still living
part left answer bit last
want thin reach change start rest
picture back plant trust risks
choice make cut measure object set
time design long handle can
doing scatter see will current size
ducks fit model text one
experiment bands water Earth points few
test low field reverse numbers
bridges result walk host play down
bars remains estimate position now
lack ever know thematic miss here
rough taint part act path
main win in each lay real
hang line sure log rid
imp on merge wing present cause
raw rust ratio mode pend
gist sump thing inner not for
and sign too stab one

but have moment till section end
tree tar cert pot red
if right we get rest way
ridge own posit

C. V's delivery similar to section A while M create rolling waves of sound. 2nd voice initially overlapping with V in duet but perhaps developing a dialogue:

a region inside which long-chain molecules how weather will evolve
a carrier membrane the physiology that underpins
for instance cloud physics the trouble is changes in human dynamics
the desire for order back come these
natural systems catalysts made from titania whether something is extinct
if you counted enough how to interpret
mechanisms by which over thousands of years the immune system of
relaxing the assumption that defies the way you
but often you can't from day to day that flow to perturbations
look at past environments how people will react
we all contain carbon we empirical biologists need to be clearer
we do not expect not because the table
is a midden sitting in your office in the sewerage system
in a research environment how moisture works inside
a new set of toys within 10% error call this Uncertainty Management
to look at populations we get some surprises
we will routinely have it's fine to say having both is good
people self-select without any external field
to measure symmetry yes it's going to it switches back for
appropriately & correctly of the ocean circulation
20,000 years ago or one slightly different can be less demanding
decorate that with microbes that clean up

The duet/dialogue stutters to a halt. M gradually restrain improvisation into continuous background sound for

4th Movement

although here M are free to improvise response to individual lines, particular

words etc – V modulates reading in counter-response, perhaps repeating lines or phrases but maintaining line-pauses as before:

I make a lot of assumptions because
we've only had one Earth
a region inside which you can see some
badly behaved errors we can't get rid of altogether
this particular parameter this inherent instability this
field has been in flux for the last 10 years
it depends very much on some
variations which tend to be averaged out
in one of its 500,000 iterations produced minutes later
you can calculate the particles emitted
you have a good feeling but
however fine your dissection of
a mathematical forest with ridges in the middle
emergent phenotypes in nutshells
a highly non-linear model you had to
design an experiment to test
a set of images of the same object
at discrete points from global down to local
where it's involved in the public realm
I would understand the desire for order
as a different simulation
when you're looking at small changes in the input
but can't prove there's a near-identical corridor
that's a two-way street once you've put
some text into a new set of toys
look at past environments
you can see the prediction's
a trade-off in terms of the scatter
over thousands of years within 10% error
that flow to perturbations
represented visually by bands of uncertainty
making simpler or more complicated models
you don't know what's going on in between
an antler-pick cartoons Prince Charles a few pigeons
(inverted commas) (remains of) (probably)
we know people self-select on this axis

it isn't an admission of failure
when the benefits outweigh the risks
I have no choice but to
work out how much I trust a singular fit
most of us tend to be less explicit about the well-known
errors smaller than the points on the graph
20 years 500 years
between many assumptions and a few

after which M improvise to end.