Is any explanation better than none?

Over-determined narratives, senseless agencies and one-way streets in students' learning about cause and consequence in history

What do we know about progression in historical understanding? In *Teaching History 113*, Lee and Shemilt discussed what progression models can and cannot do to help us think about measuring and developing pupils' understanding and illustrated their discussion with reflections on what is known about progression in the understanding of evidence. In *Teaching History 117*, Lee and Shemilt explored what is known about progression in the understanding of accounts and interpretations. In this article they apply their formidable knowledge and experience to historical explanation and causal reasoning. What does meaningful progression in historical explanation look like?

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To trace something unknown back to something known is alleviating, soothing, gratifying and gives moreover a feeling of power. Danger, disquiet, anxiety attend the unknown – the first instinct is to eliminate these disturbing states. First principle: any explanation is better than none. (Friedrich Nietzsche)

An historical enterprise that describes 'what' happened without attempting to explain 'how' and 'why' the past unfolded as it did is trivial; and one unable to answer a reasonable proportion of 'how' and 'why' questions is bankrupt. Closer to home, we may agree that the status of history as a secondary subject is open to legitimate challenge unless it equips students to make sense of the ways in which the past has led to the present, to understand how and why things happen in human affairs, and to appreciate how the consequences of individual decisions and collective actions may propel us towards less or more desirable futures. So as well as being able to describe and explain the past, students must also understand how and what historical explanations signify for analysis, decision-making and action in the present.[1] It follows that Nietzsche's sardonic 'First principle: any explanation is better than none' cannot hold for school history.

Students' explanations of the past may be deemed 'better than none' if and only if certain criteria are met. These are given in Figure 1.

The validity of the first two criteria is self-evident: students should construe the 'present' as the leading-edge of a 'past' winding its way into the future and understand how future possibilities are both created and pre-empted by 'initial conditions' located in the past-present (not just in the 'present' whenever this may be). They must also grasp how the conceptual apparatus used to make sense of reconstructed yesterdays may, with appropriate modification, be transferred to analysis and evaluation of lived todays and anticipated tomorrows.

The third criterion acknowledges Nietzsche's scepticism about academic as well as everyday explanations. No explanation is more robust than the premises on which it is grounded; and, in history, it is sometimes easier to explain what should have happened (but did not) than what did happen (but should not have). In using knowledge of the past to make better sense of the present and, above all, to inform collective attempts to navigate away from less desirable but causally possible futures, future citizens must recognise not just the epistemological limits on what we can claim to know and understand but also that what we seek to explain is, in the words of David Christian, an 'endless waltz of chaos and complexity', that 'order and chaos shape all our attempts to understand our world.'[2] In sum, students must bear in mind that historical

Figure 1: Criteria for evaluating student explanations of actions and events, states of affairs, changes and developments in the past

1. **A conspectus of what happened in the past, and an understanding of why it happened informs worthwhile analysis and evaluation of present realities and future possibilities.**
2. **Premises about how and why things happen in human affairs are validly generalized from what is understood about the second-order concepts underpinning historical explanation.**
3. **The limits of historical explanation and uncertainties in our knowledge about the past are understood and acknowledged.**

explanations are limited and imperfect, in part because we are not smart enough to crack it but also because history does not always know what it is doing.

The three criteria listed in Figure 1 apply to the ultimate not the intermediate outcomes of history education. It follows that the following rider is as obvious as it is important:

For students whose historical education is ongoing (one or more term of full-time teaching remains), a usable conspectus of the past and mastery of second-order explanatory concepts **either** meets criteria 1-3 (see Figure 1) **or** enables students to progress to a point at which criteria 1-3 are fulfilled.

Research-based models of progression chart the paths along which students' consciously held ideas and tacit assumptions about causal explanation, and other aspects of historical thinking, typically evolve.[3] As well as informing assessment instruments and mark schemes, models of progression enable us to distinguish the student ideas we can work with from those that demand disconfirmation, and to select instructional strategies and methods likely to promote rather than impede the productive development of students' explanations and understandings.

Research-based models of progression for historical explanation

This article outlines a research-based model of progression for historical explanation which is summarised in Figure 2.[4] It is an interim one, as research is still in progress, and has been simplified in two respects. First, it is restricted to six levels, the last of which is conjectural, representing major watersheds in the progression of students' understanding.[5] Second, the model sets out progression in one dimension, and ignores evidence for increasing complexity and sophistication on other possible dimensions of students' ideas.[6]

Level 1 assumptions and the narrative fallacy

As with all second-order concepts, students' understanding of historical explanation is rooted in everyday common sense. Questions about 'why' events occur are thought to be answered by the fact of their existence: the explanation for occurrence is immanent in the reality of being. For example, Paul, a Year 10 student, asserts that the 1914-18 war occurred because 'Germany invaded Belgium'. In and of itself this description of events may be adolescent shorthand for a more complex explanation, but the follow-up interview exchange reveals common-sense denial of any question worth answering:

Interviewer:	*But why did Germany invade Belgium?*
Paul:	*Because the Kaiser told them to.*
Interviewer:	*But why did the Kaiser tell them to?*
Paul:	*To start the war.*[7]

This and other circular arguments expose an assumption that the 'why' is intrinsic to the 'what':

Interviewer:	*How do you explain things in history?*
Ajeet:	*We just have to write down what happened.*
Interviewer:	*Do you ever wonder why they happened?*
Ajeet:	*No…I know why they happened.*
Interviewer:	*[Non-verbal question]*
Ajeet:	*'Cos it did same as anything else.*
Interviewer:	*If I drop this pen why does it fall?*
Ajeet:	*'Cos it got dropped.*
Interviewer:	*Easy, yes... Is it so easy to explain why World War II occurred?*
Ajeet:	*'Cos they had a fight.*

Even more able students may find it difficult to progress beyond such common-sense conceptions if trained to imitate the prose of professional historians before mastering the conceptual apparatus underpinning what they write. By allowing the tortuous processes of explanatory arguments to be obscured by persuasive end-products, too early an emphasis upon the language and structure of explanatory writing may reinforce common-sense Level 1 assumptions and result in a variant of what Nicholas Taleb terms 'the narrative fallacy'.[8] Taleb supposes that historians fool themselves into writing semi-fictional after-the-event rationalisations of the past when, in reality, the cogent narrative is rarely more than the tip of a largely submerged iceberg. In the words of J.L. Gaddis, 'historians don't like to display ductwork' and usually bury causal complexities beneath polished façades of explanatory narrative which, as Richard Evans admits, may convey the impression of an 'over-determined' past.[9] Evans need have no fear for Level 1 students; they fail to see under- or over-determination as an issue. For them, the conceptual distance between a wholly undetermined past in which things 'just happen' and a totally determined past in which things 'must happen' is wafer-thin, more a matter

of expression than of meaning and, under pressure, students may oscillate between the two views without perceiving contradiction. This too is a form of 'narrative fallacy' but one more primitive than that identified by Taleb. More serious still is the disposition of Level 1 students to think that historical explanations are true or false in the same way that statements of fact are true or false, i.e. that unless someone is lying or has misremembered, an explanation of why World War 1 occurred has the same truth status as a description of what happened on the first day of war.

As previously noted, Level 1 thinking is rooted in common sense. Everyday explanations usually take the form of excuses (offered by or to the student) or reasons why the student should or should not do something. Neither form readily transfers to explanations of the contents of an impersonal past. In school, explanations may be equated with provision of additional information or 'showing how' something is done; and in history lessons students are thus inclined to accept explanations offered by teachers and text-books as readily as they accept facts. They also expect to be told and expect to learn by rote the answers to 'how' and 'why' questions much as they learn answers to 'what' questions. Teaching students how to write explanatory narratives before they master the conceptual apparatus hidden in 'the ductwork' may be construed as a *genre* issue requiring mastery of certain linguistic structures and substitution of one set of connectives for another, 'because' for 'and then', 'so' for 'next'. In a tough-minded and insightful article J. Evans and G. Pate allude to this possibility when they bemoan the fact that some of their 'students had met the standards of explanatory writing but for us, this missed out all the things that sit behind writing and thinking.'[10]

This is not to dismiss 'language for explanation' elements of cross-curricular strategies and still less is it to devalue efforts to teach students how to communicate ideas and arguments. What is asserted is the primacy of conceptual substance over literary form. In order to produce anything more than explanatory pastiche students must understand the nature of what is to be explained and master the apparatus buried in the ductwork, which mastery may be occluded by precocious imitation of professional texts.

Level 2 assumptions and the one-size-fits-all fallacy

For the generality of students, the distinction between describing and explaining the past becomes clear once they transfer the common-sense concept of 'agency' to history. For Helen, a Year 10 pupil, the Holocaust had to happen:

> *...because the people in charge made that happen… We don't have charge but the leaders have... that's what they wanted. They weren't going to make what they didn't want happen, were they?*

At Level 2, 'events' are equated with 'actions' and 'intentions' are thought to shape 'outcomes'. A common-sense corollary of agency-based explanations is that history is made by a minority of rich, powerful and famous individuals, not by the mass of ordinary 'losers'. Helen, quoted above, goes on to assert that historians don't need to know about plans that went wrong because 'they didn't cause anything then if they went wrong'. As they stand, Helen's ideas are open to productive development and extension since people do make history, if not quite in the way she supposes. The real show-stopper is the tendency of Level 2 students to regard impersonal factors and events as anthropomorphic or 'senseless agencies' able to do and make things alongside kings and conquerors, inventors and celebrities.[11] Students talk about 'causes' but construe them as a species of especially potent events able to make other things happen. Helen, for instance has no doubt that World War II, caused in her view by the invasion of Poland, could not have been caused by the Anschluss or Munich Crisis because 'the other things weren't as prominent... it's [the invasion of Poland is] more outstanding'. The majority of events, like the mass of people, in history are insufficiently important to make things happen! Level 2 assumptions are seductive, in part, because they enable facile answers to be given to tricky questions. Students do not need to wonder what the Versailles Treaty or an economic factor or even 'an accident of history' desires or intends for the 'agency' assumption to obtain. They simply need to assume that things happen in the past because someone or something 'does' x or 'makes' x so. The potency of Level 2 ideas also follows from the ease with which what is heard and read in class can be assimilated to them. For instance, references to multiple causes and factors make good sense because, as one student avers, '…three men can be pushing a car and a fourth comes along and helps. It makes it easier for the other causes'.

Although open to considerable refinement, Level 2 constructions often pre-empt progression to higher levels by locking students into the assumption that everything can be explained in the same way, that a single model of explanation fits all cases. Worse still, common-sense Level 2 assumptions about the ubiquity of human and senseless agency-based explanations may be reinforced by tasks that juxtapose questions about why people behaved as they did with questions about why things occurred. Promiscuous mixes of statements and questions about actions, collective mentalities and events may be appropriate for students able to distinguish intentional, empathetic and causal modes of explanation but disabling for those who cannot.[12] It follows that we should strive to wrench students out of Level 2 comfort zones by disciplined use of language that distinguishes 'reasons for actions' from 'causes of events', by direct teaching of the differences between models of rational action and models of causal connection, and by focusing on questions to which agency-based explanations yield inadequate answers: Why do things turn out differently from what anybody (even rock stars) want? Why are intended outcomes accompanied by so many unintended ones? Why can the unco-ordinated actions of large numbers of individuals have consequences contrary to what anyone intends, e.g. transport systems collapsing on sunny bank holidays? Why did so many people in the past want and do things that seem so wrong, weird and crazy?

Level 3 assumptions and the fallacy of over-determination

Once students cease to regard 'events' as actions (of sensible and senseless agencies) and routinely construe 'actions' as having event-like outcomes, they grasp the concept of 'unintended consequence' and understand that the causes of things are themselves the effects of other causes. In the words of Peter, aged 15, 'It's a chain, isn't it, history? It all carries on from the one thing, and the World War [WWII] is the missing link in that chain.' This is a signal advance on what went before. Because

causation is now seen to operate on an inter-generational as well as a human scale, because chains of cause and effect enable lines of development, it becomes possible for students to conceive of a past with shape and direction rather than, as hitherto, as temporal space in which things just pop into existence (Level 1) or are made to happen (Level 2). It is now possible for students to attribute meaning to the course of history as a whole.

The most serious limitation of Level 3 conceptions is that history is assumed to be going somewhere – to the present – and to have this as its purpose. History tends to be seen as a **one-way street** of over-determined landmarks on the route from 'then' to 'now.'[13] The logic of this conception is seductive: 'causes' make things happen; if things are made to happen they have to happen; and if things that are caused do not have to happen, what is it that 'causes' actually do? Students may dutifully learn that nothing in history is inevitable but be unable to reconcile this assertion with the statement that most or all historical events are caused to happen. It is hard for them to avoid impalement on the horns of the determinacy v. indeterminacy dilemma. Some students elect to combine indeterminacy on short time-scales with determinacy on long ones. Thus, even when willing to concede that an event, like the signing of Magna Carta, need not have occurred as and when it did, Level 3 students may insist that it would have been signed later or replaced by an equivalent event like the People's Charter.[14] Other students are more tough-minded, talking and writing as though causes have mass and inertia. For example, Tyson – a Year 10 student – attempts to evade an over-determined past by arguing that, 'New causes [could] come along and knock out some you've already got' and, when asked to explain where these 'new causes' might come from, concedes that, 'There are always causes of no war as well as for war but we had more for war so we had one [WWII].' At its extreme, mechanistic conceptions of causality lead students to posit 'holes in history' as the only logical alternative to what actually occurred. When asked, 'What would have happened if this [particular] 'cause' had not occurred?' Tyson replies, 'Nothing…you'd have nothing.' In similar fashion, Paris writes:

> *The statement says, 'It* [Hitler's invasion of Poland in September 1939] *could have caused something else…Britain and France could have let him get away with it.' If that is so nothing would have happened, so the statement contradicts itself.*

And some students go so far as to use the reductio *ad absurdum* argument that what was caused to happen had to happen because otherwise history would come to a full stop.

Level 3 assumptions represent a genuine advance in the natural history of students' ideas. Once causes are construed as particular kinds of connections amongst historical phenomena, students become able to conceive of history on large scales and to envisage the present as the product of a deep and structured past. These advances notwithstanding, Level 3 conceptions are profoundly limited in that they only admit of hypothetical not real possibilities. Students acknowledge alternative past-presents much as non-scientists go along with alternative universes (the multiverse) proposed by theoretical physicists. Alternative past-presents and universes are taken to be 'imaginary possibilities' comparable to Brigadoon, a fictional village in Scotland in which the people are forever children.[15] At best, they are considered 'logical possibilities' that break no natural laws but do not exist or could never have occurred. It is logically possible for Port Vale to win the Champions League in 2015 but, as everyone outside Burslem knows, this is never going to happen – it is not a causal possibility. Only when students escape the vicious dualism of an undetermined v. an over-determined past-present and construe the actual past-present as a special case within a set of causally possible past-presents are they able to offer historical explanations that, in Nietzsche's phrase, are 'better than none'.

The Level 4 breakthrough into possibility thinking

At Level 4, pupils and students re-conceptualise causal explanation. In a written answer to a question about the origins of World War II, Thomas, a 15 year old boy, understands that history is not a one-way street:

> *The nature of 'cause and effect' is such that people are neither caused to do something, nor do they have an absolute choice of what they can do. They are caused to have a choice of several things, e.g. when a car approaches a T-junction the driver has a choice of turning right or left. The cause of the layout of the road is such that he has a choice but he cannot choose to go straight on. He still has a choice but it is limited. The layout of the road is both the cause of the choice and the cause of the limitation.*

The economy and cogency of this answer is impressive. Thomas clearly construes *actuality* (say turning left) as a special case of *causal possibility* (turning left or right). Alternative outcomes are now thought to be real as well as logical possibilities. One consequence is that causal questions are no longer understood as requests to explain 'why x rather than not-x?' ('why WWII rather than nothing?). They are now understood as requests for two sorts of explanation: 'why x rather than some other outcome?' (why WWII not an uncontested expansion of Nazi territories?) and 'why were certain outcomes causally possible while others were pre-empted?' (why is it necessary to explain the failure of the western powers to strike a deal with the USSR when Poland's failure to cede its 'Corridor' to Germany is deemed to be causally unproblematic?). As indicated in Thomas's final sentence, we seek to explain (1) why certain possibilities exist at certain points in time and space and (2) why, for all practical purposes, other possibilities are closed down.[16] Consciously or not, Level 4 thinkers pose counterfactual questions and, thereby, begin to explore possible pasts in ways adaptable to analyses of possible futures.

Since no more than a minority of 14–18 year old students make the breakthrough into 'possibility thinking' and distinguish between necessary and sufficient conditions, it is remarkable that some Year 7 students show signs of thinking in this way. Melissa (Year 7) explains that, although the Magna Carta could not have been signed in 1215 had the Norman Conquest of 1066 not happened, the success of the Conquest did not guarantee the occurrence of Magna Carta because, *'It gives the possibility that it could happen but leaves the possibility that it doesn't have to happen.'* Until this point the word 'possibility' had not been used in the interview. In her own way, Melissa defines the Norman Conquest as a necessary but not sufficient condition for Magna Carta. Her argument may be debatable but the terms in which it is conducted are impressive.[17]

Figure 2: Outline model of progression for causal explanation

LEVEL 1: explanation in terms of description
'Causes of' and 'reasons for' are assumed to be immanent in past events and behaviours. Students may make appropriate use of causal and intentional language – 'because', 'necessitated', 'motivated', 'deterred' and so on - and, in so doing, demonstrate mastery of a literary genre without being aware of, let alone understanding, the conceptual apparatus underpinning historical explanation.

LEVEL 2: explanation in terms of agents and actions
Explanation is detached from description. Description pertains to 'what was done' in the past. Explanation now entails identification of 'who or what done it'. People usually do things because they want to but sometimes make mistakes and do things in error. This agency model of explanation is generalised to include movers and shakers in the natural world (volcanoes and weather) and anthropomorphic entities like 'luck' and a plethora of teacher-supplied 'factors' (war, religion, politics, economics, etc.). Events like storms, states of affairs like the Enlightenment and factors like the balance of power may be designated 'causes' but students assume that they 'do stuff' and 'make or break things' much like human agents. The power 'to cause' is thus construed as a property of a thing or a person not as a connection between two or more events.

LEVEL 3: explanation in terms of causal chains and/or networks
Historical explanation ceases to be unitary as students realise that 'actions' and 'events' should be explained in different ways. (In consequence, models of progression for intentional and causal explanation bifurcate at Level 3. The model of progression for empathetic explanation, which takes collective mentalities as its object, also connects with those for intentional and causal explanation but does so in ways too complex to be explored in this article.) Students are now able to explain unintended consequences without reference to 'mistakes' or to the supervening actions of especially potent agencies – kings, luck and so on. They understand that intentions may explain actions without being sufficient explanations for what actually happens, that much of what occurs in history is not 'done by' anybody or anything but arises from interactions among events. Although all actions are recognised as being events the converse does not hold and, in any case, while an action may be directed by an intention its interactions with other events are not (although some interactions may be anticipated). Students also assume historical events to be both causes and consequences rather than one or the other, and some hypothesise 'chains' of cause and effect extending backwards in time. The focus is clearly on 'links' and impersonal processes not on 'agencies' able to make things happen by fiat. One limitation of Level 3 conceptions is the tendency to view history as a one-way street leading from past to present. A second limitation is the failure to distinguish between 'causal possibility' and 'logical possibility' such that the only perceived alternative to what actually occurred is that 'anything could have happened', history is either a 'one-way street of knock-on causes and effects' or it's a sort of casino in which 'things just happen'. Students see no middle-ground between determinacy and indeterminacy.

LEVEL 4: explanation in terms of conditions for actual and possible events
The course of history ceases to be seen as a one-way street from the past we had to the present we have. Because the actual past and present are construed as (or much as if they were) special cases within a set of causally possible pasts and presents, students are no longer forced to choose between an over-determined and an undetermined past-present. (N.B. a past in which 'causes' are themselves uncaused and, in consequence, in which the past casts no shadow is undetermined on all but the shortest scales.) The past is seen to be determined since prevailing 'conditions' permitted the occurrence of x or y or z or... n and pre-empted that of p or q or r or... n, but not over-determined because the conditions that explain the occurrence of x also allowed that of y or z or... n which did not but could have occurred. Although few students talk about 'necessary conditions' some explain that 'causes' make some things 'possible' and others 'impossible' and, thereby, validate counterfactual exercises as ways of analysing and evaluating

causal arguments. At Level 4 the long-term impact of such key events as the first Neolithic Revolution or European settlements in the Americas also become intelligible in terms of the opening and closing of future possibilities instead of as a deterministic series of links in a causal chain. Perhaps most important of all, 'possibility thinking' changes the name of the explanatory game: instead of explaining 'Why x?' – a question form painfully close to the metaphysical query, 'Why is there something rather than nothing?' – students explain why we could have had x or y or z as opposed to p or q or r, outcomes which on the basis of past experience people at the time might have anticipated or sought. Despite its sophistication this species of 'possibility thinking' begs many questions: few students grasp the distinction between arguments that 'p' is not a causal possibility and 'p' is a causal impossibility (they remain trapped in two-value logic) and rarely make explicit what is necessarily taken as given when calling other things into question.

LEVEL 5: explanation in terms of contexts as well as conditions

Evidence for this level of causal explanation is restricted to small numbers of students who strive to explain why the causal possibilities allowed by any set of necessary conditions appear to be restricted by something over and above the conditions themselves, by a *gestalt* of time, place and situation. Generalisations about 'context' thereby augment the identification of necessary conditions and serve as a second layer of explanation, one in which the operations of necessary conditions are contingent on the contexts in which they operate. In this way, the concept of 'contingency' appears to supplant 'randomness' as the converse of 'necessity'. Explicit reference to 'context' is infrequent: the concept is either implicit or words and phrases like 'background', 'circumstances', 'climate of opinion' or 'something to do with the times you live in' are used. The concept of 'context' may be purely 'situational' as students grasp that the concurrence of independent actions and unrelated events sets limits to their causal interconnectivity and the cumulative impact thereof is thus a blend of short-lived signals and background noise. A loose analogy might be drawn with a stage on which groups of actors perform unrelated scripts without reference to each other; each group contributes to a context, both dynamic and constraining, against which all others play. Other students appear to have some apprehension of 'historical contingency', of the impact of the past upon institutional practice, collective and individual consciousness. This may manifest in the simple observation that, for example, 'People won't react the same [today as in 1933]. I mean, people have *heard* about Hitler and mightn't fall for the same thing twice'; or underpin explanations as to why, even with the same configuration of conditions and trigger events, history can never repeat itself. For all its limitations, Level 5 thinking is significant in three respects: a second layer of causal explanation is added to that of possibility thinking; students construe contingency as different from dice rolling; and, most important, history enters into explanations as something other than an infinite regress of causes and effects.

LEVEL 6: causal concepts are theoretical constructs

Level 6 thinking has not been observed with sufficient frequency amongst secondary or PGCE students to be more than a speculative statement of what, 'in the best of all possible' education systems, might be achievable. The premise from which all else follows is that explanation has both epistemological and ontological dimensions. The validity of every explanation is relative to questions posed as well as to what is known about the past. We have criteria that set limits to what is explicable and for judging the quality of explanations. We also use models of how and why things happen in human affairs that are both general and period-specific. Once competent to handle the interplay of explanatory tools with assumptions about the nature and dynamics of past-present realities, students may understand why outcomes that look as though they ought to be 'causally impossible' sometimes occur, why explanations of large-scale phenomena are more secure than those of temporally and spatially localised ones and, above all, of how an understanding of the past can and cannot be used to inform analysis and evaluation of present experiences and future possibilities.

At Level 4, students realise, first, that from a given configuration of factors, actions and events *a number of mutually exclusive (as well as some inclusive) outcomes may be expected to follow*. The second and critical realisation is that these selfsame causal factors, actions and events *select against the majority of logically possible outcomes, including some that were hitherto admissible*. For the first time pupils and students are able to escape the intuitively unsatisfying choice between a history in which effects are mechanically determined and one in which 'anything could have happened' and causality has no place. This is the watershed beyond which historical explanations can inform valid and useful analyses and evaluations of present realities and possible futures. Level 4 explanations may thus be considered 'better than none.'[18]

So if Level 4 'possibility thinking' begins the name of a 'better than none' explanation game, how might it be taught? The first point to note is that most students must engage with dilemmas of causal determinacy v. indeterminacy before attempts to push them across the Level 4 threshold are likely to prove effective. Second, factor classification and prioritisation tasks should be avoided. Unless and until students operate at or beyond Level 6, the categorisation of factors as 'political', 'economic', 'religious' and so on may amount to little more than the naming of relatively meaningless parts; and determination of the relative importance of causes may prove a distraction for students unable to identify a minimal set of necessary conditions within lists of plausible causal contenders. Average and advanced Level 3 students rarely have difficulty identifying multiple causes; their problem is knowing when to stop and, when presented with lists of putative 'causes', in reducing the many to the few.[19] If the second is a self-denying ordinance, the third point is a positive recommendation: focus upon the core dilemma implicit in Level 3 assumptions, the fact that causation is thought to entail determination.[20] This requires analysis of the nature of the links among historical phenomena, of exactly how one event interacts with (or impacts on) another. In a series of brilliant articles between 2003 and 2006 Arthur Chapman and James Woodcock have suggested how this might be done.[21] Chapman argues that understanding of conceptual distinctions between, for example, 'preconditions' and 'precipitants', 'triggers' and 'catalysts' is facilitated by use of extended analogies: the story of Alphonse the camel is memorable in this connection. He also advocates use of artefacts, including plastic toys like 'Buckaroo', to model the ways in which causal processes are assumed to work. Episodes from the authors' prior classroom experience attest to the power of Chapman's suggestions. For instance, the old 'Mousetrap' game has been used to model the causes of World War I and, at one and the same time, the distinction between necessary conditions and causal triggers. Students equate each piece of Mousetrap equipment with a causal factor (French desire to recover territories ceded after the Franco-Prussian War... Anglo-German naval arms race... French finance for Russian strategic railways... and so on). These factors constitute a set of necessary conditions for trapping the mouse (= for WWI). Should one be missing or break down (= be changed by events) the mouse cannot be caught (= WWI is no longer a causal possibility), but even when all necessary conditions are in place something else has to happen: a ball-bearing has to be set in motion (= a trigger event). One trigger event may be sufficient for the mouse to be trapped but more may be needed. As long as all necessary conditions remain in place the trap (= Europe pre-1914) remains in what condensed matter physicists call a 'critical state' and vulnerable to the impact of 'trigger' and other events. If the mouse is trapped (if WWI occurs) the outcome is explicable and, with hindsight, may appear unavoidable. But which of several potential 'trigger events' collapses the critical state, how many times a ball-bearing has to be released for the mouse to be trapped (for World War I to be precipitated), is not computable. Indeed, in the Mousetrap Game, release of a ball-bearing sometimes disturbs a piece of equipment (= eliminates a necessary condition) such that the possibility of the mouse being trapped in the future is now pre-empted. Students may be asked to equate potential 'trigger events' for World War I in the Balkans, in Morocco and so on, with a sequence of ball-bearing releases. They discover that World War I (more precisely, a general European war) could have started earlier or not at all, that while World War I was most definitely 'caused' to happen it was not inevitable.

The fact that this and other models break down once students begin to ask higher level questions is a virtue not a weakness of the approach since the challenge then becomes to improve the explanatory model. For example, one of Chapman and Woodcock's other artefacts, based on a maze, appears able to model causal processes in more refined and elaborate ways than can 'Buckaroo' or 'Mousetrap.'[22]

A succession of artefacts like Buckaroo, Mousetrap and the marble maze can do more than model 'possibility thinking', it can stimulate reflexive explanations and, thereby, move students beyond Level 4 into a new appreciation of the nature and logic of the historical enterprise. Identification of the limits and weaknesses of models they can see and play with and, above all, recognition that some models are superior to others – even if that superiority is relative to the questions posed or history considered – helps students to become meta-cognitively aware of the tacit models in their own heads and hence of the impossibility of explaining anything without recourse (1) to models of how and why things happen in history and (2) to models of what explanations ought to look like.

Level 5 and the wide blue yonder

As indicated in Figure 2, the ability to engage with 'possibility thinking' is not the final chapter in the natural history book of students' thinking about causal explanation. Some students make sufficient sense of what teachers say about the role of context in causal explanation to understand that 'preconditions' and 'triggers' operate within forms of life, systems of belief and past histories that are taken as given in answers to questions posed.[23] We may analogise this as a species of 'black box thinking' that assigns roles to hitherto unexamined boxes, and acknowledges that in a different box (another time and place) the same mechanism (causal model) and inputs (conditions and triggers) would yield different outputs (consequences). Although far from common at present, there is good reason to believe that worthwhile numbers of 14-19 students could be taught to generate and evaluate Level 5 explanations. The next steps are conjectural (see Level 6 of Figure 2), but perhaps should be rehearsed so that we can recognise, reward and work with questions and ideas offered by students who occasionally cross frontiers leagues beyond examination board expectations.

Recapitulation and conclusion

The model of progression for causal explanation advanced herein is a highly simplified version of one in process of refinement and elaboration. It is simplified, first, in disregarding fine distinctions important for teaching and assessment; second, in omitting reference to models of intentional and empathetic modes of

explanation that share a common root and stem (Levels 1 & 2) with the causal mode; and third, in ignoring the progression of ideas and assumptions unrelated, or obliquely related, to the hierarchy of levels presented. The simplified model presents a hierarchy of watersheds leading to levels of causal understanding deemed to be worthwhile – in Nietzsche's phrase, 'better than none' – and informs evaluation of teaching strategies and methods that either inhibit or facilitate student progression to higher and ultimately worthwhile levels.

Since none of this is demanded by the National Curriculum or public examination specifications ,why should we bother? Maybe we should bother because if we aim for nothing beyond good GCSE and A level grades it really does not matter whether these grades attach to history or to celebrity studies. If, on the other hand, we teach history as a thinking subject with open frontiers and aim to develop the understanding necessary for students to make sense of the present as the leading edge of the past, it follows that conceptual thresholds must be crossed to ensure that the uses of history are more often benign than malign, enabling than disabling. This article has sought to identify such thresholds and suggest ways of increasing the proportions of students able to cross them. Perhaps the last word should be given to an able student whose understanding surpasses the perceived aspirations of his teachers:

> *…the* [first] *statement* [about the causes of WWII] *considers the problems of the past by suggesting what might have been the consequences of an event and not merely what was the consequence…* [The contrasting statement] *only describes an event without there being any room for discussion of possible results, in much the same way as we, ourselves, are taught history as a subject which is completely sealed and cannot be changed.*

REFERENCES

[1] This is to argue for one version of what has come to be known as 'historical consciousness'. See Lee, P. (2004) 'Walking backwards into tomorrow: historical consciousness and understanding history' in *International Journal of History Learning, Teaching and Research, 4* (1), www.ex.ac.uk/history resources/journal7/contents.htm

[2] Christian, D. (2004) *Maps of Time: An Introduction to Big History*, London: University of California Press, pp. 505-511.

[3] Research-based models of progression should not be confused with *a priori* models, e.g. those represented by successive incarnations of the NCAT. They should also be distinguished from instrumental models used to construct and assess progressive units and schemes of work. Research-based models sacrifice detail and precision to achieve acceptable standards of reliability and robustness: they are low-resolution maps that hold true for students in general but not for every class, still less for every individual, and register big leaps not small shifts in student progress. Instrumental models convert low-resolution research-based models into high-resolution bespoke models tailored to particular student populations and teaching programmes. Structure is taken from empirical research and augmented by hi-resolution detail grounded in direct experience and personal judgement.

[4] The model was developed through analysis of Schools History Project (SHP), Cambridge A-Level History Project (CHP) and Concepts of History and Teaching Approaches: 7-14 project (CHATA) research and examination material and is currently being extended and updated against History Framework Working Group (FWG) data. The FWG was established at the Institute of Education, University of London in 2007 under the leadership of Jonathan Howson.

[5] In its simplified form, the model described in Figure 2 may be taken as definitive since analysis of additional data from Year 7 pupils promises to complicate content without confounding structure. Although few students operate consistently at a single level, the model is progressive in that (a) correlations between levels are not statistically significant and decline in magnitude with rank-order distance; and (b) it leads students to the point at which they are able to identify, use and ultimately offer explanations that 'are better than none' and thus meet criteria 1-3 in Figure 1.

[6] The comprehensive, and yet to be finalised, model of progression for understanding of causal explanation in history has a branching structure. Two conclusions follow: determination of trunk v. branch lines of progression is a methodologically complex business; and even if teaching equips students to offer increasingly clever, complex and articulate explanations of historical phenomena, learning does not necessarily progress in productive directions. Indeed, it is likely that, whatever other good they do, some teaching strategies and methods reinforce primitive and unproductive assumptions about historical explanation.

[7] Unless otherwise indicated, all quotations are taken from published and unpublished SHP evaluation data.

[8] Taleb, N.N. (2007) *The Black Swan*, London: Penguin, p.64.

[9] Gaddis, J.L. (2002) *The Landscape of History: How Historians Map the Past*, New York: Oxford University Press, p. 3. Evans, R.J. (1997) *In Defence of History*, London: Granta, pp. 157-158. Evans' words are open to the interpretation that historians typically overreach themselves but we take him to mean that when causal arguments are expressed with force and elegance a given sequence of events may acquire an aura of inevitability.

[10] Evans, J. and Pate, G. (2007) 'Does scaffolding make them fail? Reflecting on strategies for developing causal argument in years 8 and 11' in *Teaching History, 128, Beyond the Exam Edition*, pp. 18-28.

[11] The phrase 'senseless agencies' was first coined by A.N. Whitehead, co-author of *Principia Mathematica* and other light classics.

[12] The tripartite classification of modes of explanation into intentional, empathetic and causal is simple but not simplistic inasmuch as finer distinctions between individual v collective action and explanations of spatially and temporally bound 'events' v. states of affairs v. changes v. lines of development etc. only signify for students operating at higher levels of conceptualisation.

[13] The metaphor of the 'one-way street' has the potential to mislead. The street of history is conceived as running in 'one way' in the sense of it having one and only one possible destination – the known present to which all conceptions of the past are firmly anchored. Much as they might speculate about imaginary adventures as invisible adolescents, Level 3 students entertain 'just suppose' representations of alternative presents without for a moment accepting the possibility of real presents alien to lived experience. The 'one-way street' metaphor also obscures differences in Level 3 conceptions. For some students the past had to be exactly as it was because it leads to a present that is as it must be. Less thoughtful students may admit that people in the past could have behaved other than they did and even historically significant events like the signing of Magna Carta or Cortes' destruction of the Aztec Empire need not have occurred without believing that the subsequent course of history and the present as we have it could have been other than they were and are. It is as though all side roads leading off the one-way street mysteriously reconnect with it before the present is reached and the journey ended. In contrast, more thoughtful students argue, for example, that if Magna Carta had not been signed in 1215 it would have been signed at some other time or would have occurred in some functionally equivalent form, perhaps as a Bill of Rights or a People's Charter. The two assumptions common to all Level 3 conceptions are, first, that the present is given and, second, that the present is the product of the past.

[14] Blow, F., Rogers, R. *et al*. (2008) *Framework Working Group Report*, unpublished document.

[15] In reality, this place is in London not Scotland, and is called Canary Wharf.

[16] Of course, extraordinary events occur from time to time and many turn out to be causally inexplicable. A car may go straight ahead at a T-junction when causal reasoning suggests that it was far more likely to have turned left or right. Some events in history remain causally inexplicable in the sense that explanations of 'what could have but didn't happen' are more persuasive than is any explanation of 'what actually did happen'. In such cases causal explanations suggest that 'something else *should have* happened' and leaves us with an enigma.

[17] This quotation is taken from 2009 FWG data provided by Benton Park School, Leeds.

[18] There is, of course, more to worthwhile and usable history than this. Other second-order concepts must be mastered and students must possess viable 'big pictures' of the entire human past, not just shreds and relics selectively ripped from the cloak and body of our island story.

[19] E.H. Carr famously argued for identification of 'the' cause, of single causes. The set of conditions necessary for an event, state of affairs or development to be causally possible may be considered a single cause, albeit one with multiple elements; and, on closer inspection, any necessary condition is typically found to be a network of interacting events and situations. In essence, historians strive to understand systems and subsystems which, at selected points in time, constitute 'the mind of history'. Carr, E.H. (1961) *What is History?* London: Macmillan.

[20] This dilemma has a long history: because 'causes' have 'causes' everything must be connected to everything else, right back to the Big Bang or some metaphysical first cause beyond reach of the most sedulous historian. Hence, 'Things cannot be known with perfect certainty because their causes are infinite.' (Pierre-Daniel Huet quoted by Taleb, N.N., *op. cit.*) It is not surprising, therefore, that able students are sometimes overwhelmed by complexity as they strive for complete explanations of past events. This quest is not just impracticable because it commits historians to an infinite regress of explanatory causes, it fails to acknowledge that the 'reach', or range of convenience, of an explanation is a function of the reality to which it pertains as well as of the question to be answered. This obtains in science and applied mathematics as well as in history. For example, were we to explain a long series of snooker ball collisions, the mathematician Michael Berry calculates that by the ninthimpact it would be necessary to allow for gravitational distortions introduced by movements of players and spectators. By the 56th impact we need to know the position and velocity of every particle in the known universe, which – with the precision required – is impossible in principle as well as in practice. (*ibid.,* p.178) Does this mean that we cannot explain why snooker balls move and collide as they do? Of course not! In practice, it just means that our explanations have a less than infinite 'reach' – a 'reach' for which, on occasions, we may need to justify limits. And in principle, it means that an adequate explanation of phenomena does not necessarily entail computability of outcomes from knowledge of general laws and measurement of initial conditions. The disjunction between explicability and computability is itself explained by chaos theory.

[21] Chapman, A. (2003) 'Camels, diamonds and counterfactuals: a model for teaching causal reasoning' in *Teaching History, 112, Empire Edition* pp. 46-53. Chapman, A. (2006) 'Asses, archers and assumptions: strategies for improving thinking skills in history in Years 9 to 13' in*Teaching History, 123, Constructing History Edition,* pp. 6 – 13. Chapman, A. and Woodcock, J. (2006) 'Mussolini's missing marbles: simulating history at GCSE' in *Teaching History, 124, Teaching the Most Able Edition,* pp. 17-26.

[22] One limitation of the 'Mousetrap' model of causal explanation is that it can only deal with binary outcomes: the mouse is trapped or not, WWI occurs or 'nothing happens'. Chapman and Woodcock's marble maze can be adapted to model a range of logically possible outcomes a few of which are also causally possible, i.e. suppose there are ten slots in which a marble could theoretically arrive but only three are operational. An advanced marble race may even be designed such that the release of a marble could, within the range of causally allowed outcomes, switch future causal possibilities on and off, i.e. suppose that slots 4, 5 and 9 are operational when a marble is rolled and that slot 9 = a general European war (some version of WWI); now suppose that the marble ends in slot 9 (= Colonel House's mission to Britain and Germany meets with sufficient success for the USA, Britain and Germany to strike a deal). For the next marble roll at least, slot 9 ceases to be operational (= a general European war is no longer a causal possibility) but slots 0 and 6 become operational. The marble race becomes capable of modelling a prescribed range of counterfactual experiments.

[23] The reality is, of course, more complicated than this. Contexts may be analysed in many ways and a broad distinction may be made between 'situational' and 'historical' contexts, the former dealing with scale and nature of causal cockpits – isolated villages v trading networks, diplomatic negotiations v. transitions from craft to factory production – and the latter factoring in the actual and mimetic shadows of the past. There is also more to causal explanation than systems of 'necessary conditions' and a series of 'triggers'; Arthur Chapman, for example, has taught students to handle 'catalysts', ways of explaining multiplier effects. And 'context' characteristics are often made explicit, e.g. in comparative explanations.