

Camels, diamonds and counterfactuals: a model for teaching causal reasoning

In the last edition of *Teaching History*, Arthur Chapman described how he uses ICT to develop sixth form students' conceptual understanding of interpretations, significance and change. In this article, he turns his attention to causal reasoning and analysis. Drawing on the work of historians such as Evans and Carr, he develops a sophisticated – but accessible – way of classifying causes that enables post-16 students to get to the heart of what a robust causal analysis might look like. He ends his article by outlining a series of ICT tasks on the causes of the 1857 Revolt in India in which knowledge, conceptual awareness and causal reasoning fit together seamlessly and in mutual support. The quality of the thinking underpinning his students' work – illustrated here – attests to the effectiveness of his approach.

Much has been said about the problems associated with Curriculum 2000 and about opportunities that were missed.¹ Perhaps it is time to 'big it up'.

The millennium offered plenty of scope – bugs, raptures, eclipses, domes and much else besides. The millennial curriculum was no different. There was scope, through centre-designed coursework options, for innovation in curriculum content. There was scope also for conceptually focused teaching and learning. Under the old regime, teachers were like eighteenth-century French peasants, panting under the burden of content whilst trying to second – guess the whims of often seemingly arbitrary powers. Whatever their faults, the new 'specs' left teachers room to breathe and, despite all the talk about the pressure of exams, the curriculum had a clear conceptual architecture that allowed creative thinking about progression.

This article simultaneously reports aspects of one experience of working under the new system and, no doubt rashly, proposes a model for the teaching of causal reasoning on that basis.² It also seeks to show how 'empire' (a central theme of British History, though sadly marginal in the 16-19 curriculum) can be effectively integrated into Advanced Level. The model for teaching causal reasoning that I am proposing has evident limits

and lacks rigour; it is probably under-theorised and certainly grounded anecdotally. On the other hand, rigour, in education as in so much else, is sometimes married to rigor mortis.

In planning for Curriculum 2000, we wanted to avoid the narrowness of focus that is possible in the new specifications – the kind of narrowness, for example, that follows from studying modern German history for three or more units over a two-year course of study.³ Whatever else history can be, it should be much more than this.⁴ We also wanted to avoid some of the more mind-numbing aspects of the old A Levels (such as the courses in comparative Factory Acts that were often misdescribed as social history) and to engage with issues of contemporary relevance. One course, in particular, ranged across continents and contained African, West Indian, American and South West Asian history in addition to such standard British topics as the Suffragette movement, and had a chronological reach ranging from the first English slaving voyages of the 1480s to the activities of the Black Panthers in the late 1960s. It is easy to engage students' interest in topics like slavery, the 'Indian Mutiny',⁵ campaigns against Sati and Thugi and the political economy of famines and in part, this is precisely because these topics prompt reflection on contemporary issues of great relevance and interest.⁶

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Arthur Chapman

The model for teaching for progression in causal reasoning that emerged out my experience of Curriculum 2000 can be summarised in the following principles:

- (a) Start by clarifying concepts and by identifying a vocabulary that will enable analysis – a terminological sieve that students can use to sort materials.
- (b) Work up exercises that will allow students to learn to use the vocabulary – wildly unhistorical exercises are as good (if not better) as historical ones.
- (c) Once there is clarity about concepts, use them to drive investigation and research – students should not be let anywhere near the historical material without their conceptual lenses polished and their questions sharpened.
- (d) Design open-ended tasks that allow students to model conceptual relationships in concrete ways.⁷
- (e) Focus on consequences as much as on classification and design tasks that require consequences to be explicitly specified – understanding causality is about reflecting on effects as much as about categorising causes.
- (f) Use counterfactual questions⁸ to build student understanding of consequences – this is the royal road to evaluating and ranking or to the elusive ‘hierarchy’ that is the ultimate aim of causal analysis.

Conceptual clarity: rigour and *rigor mortis*

Because an understanding of causation underpins not only our analysis of so much in history but also our ability to understand and analyse different and often competing accounts of the past, it is worth exploring what causation actually *means* with students. What exactly characterises the sophisticated and complex pieces of causal reasoning that historians present us with? How do they attempt to classify causes and ascribe different values to them? What makes one explanation of, say, the abolition of slavery in the British Empire different – and perhaps even ‘better’ – than another? This is exactly the question that some of our Year 12 students recently wrestled with. It was hard to see how they could successfully evaluate the relative merits of explanations that focused on the metropolis and on humanitarian ‘Saints’ on the one hand, and on insurgent slaves acting as agents of their own emancipation on the other, without developing a robust set of tools for the job.

Helping my students to understand the nature of causation seemed to be crucial. But first, I had to be clearer about it in my own mind. I started with texts such as Richard Evans’ *In Defence of History*, and attempted

to find ways of classifying causes that would challenge my students and enable them to engage in more sophisticated causal reasoning:

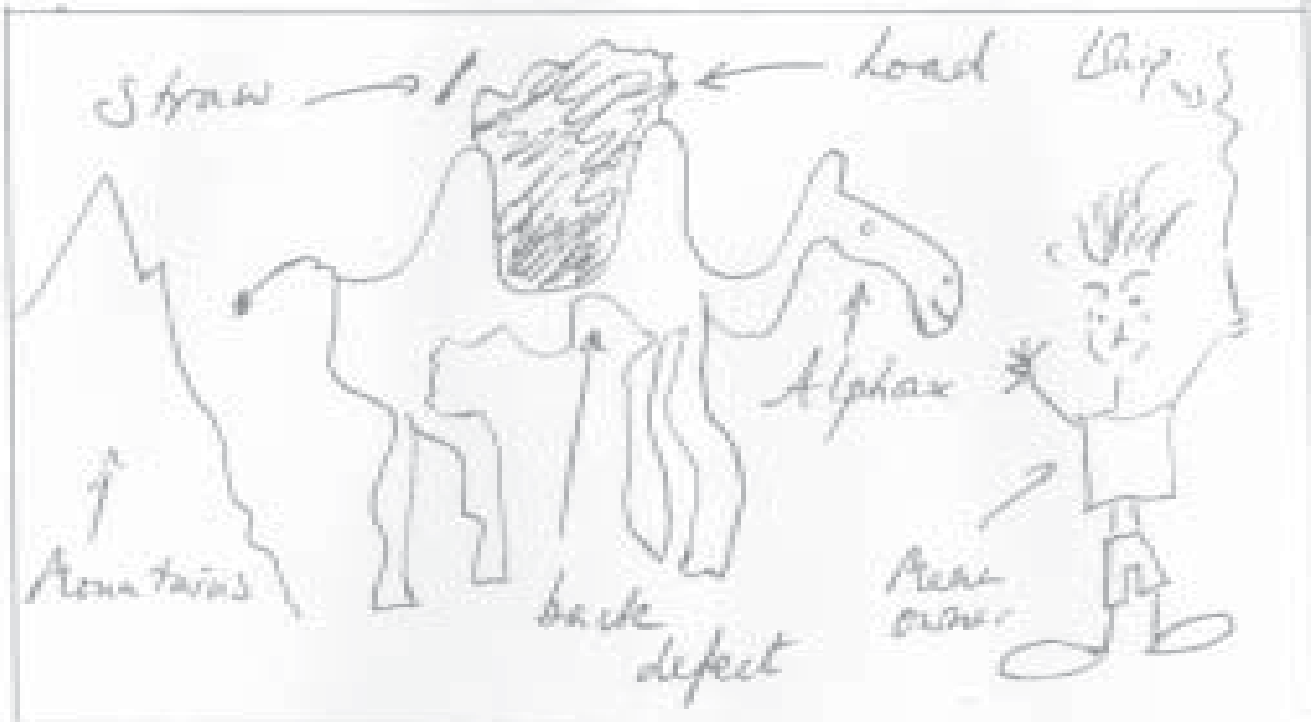
‘It is obvious enough what a cause is; we can have **necessary** causes (if A had not happened, then B could not have happened) and **sufficient** causes (A happening was enough to make B happen). Within the first category at least, we can have a **hierarchy** of causes, **absolute** causes (if A had not happened then B **definitely** could not have happened) and **relative** causes (if A had not happened, then B **probably** could not have happened). . . . Most historians will go to some lengths to avoid ‘monocausal explanation’. Almost all historians are used to the idea that historical events are frequently **overdetermined**,⁹ that is they have several sufficient as well as necessary causes, any one of which might have been enough to trigger the event on its own. Generally, however, they see it as their duty to establish a **hierarchy** of causes and to explain if relevant the relationship of one cause to another.’¹⁰

On the basis of passages like this, and a good deal of messing around with textboxes, a way of classifying causes began to emerge. It seemed obvious that causes could be differentiated according to the kind of stuff they were made of; clearly there is mileage in contrasts between such things as economic causes, on the one hand, and ideological or cultural causes on the other. Noting differences such as these, I decided, could be called analysing causes by ‘Content’. Causes could also be differentiated by ‘Time’ – we are all familiar with terms such as ‘long term’ and ‘short term’ (terms that usually have the same effect on the enjoyment of marking as phrases such as ‘this is biased’ or ‘Source 2, on the other hand, is a secondary source’). So far – in ‘Content’ and ‘Time’ categories – I had a descriptive analysis of causes. Things were starting to fall into shape. ‘Catalysts’ or ‘triggers’ were great favourites amongst my abler students who, nevertheless, tended to treat them as interchangeable with ‘Time’ categories. They were conflating description with something else. A whole new family of distinctions began to become clearer – there were triggers, there were catalysts (or were they the same as triggers?) and there were ‘preconditions’ and what they all had in common was that they focused on the roles played by causes. A ‘Role’ category seemed like a contender and role terms seemed to be doing much more interesting work than those in the descriptive categories because they were explanatory in intent. Finally, I had to confront Evans’ glib talk of necessary and sufficient causes. Whatever else they were, they certainly seemed to be about importance or – to use that favourite of examiners – ‘weight’. I had a four-term classification model or typology then. Causes could be distinguished in terms of content, time, role and importance. It seemed promising, in the sense that most things could be analysed using it. In the end, as Evans says, everything is probably ‘overdetermined’, but this typology seemed to enable the drawing of distinctions (or, in other words, analysis) and it seemed to me that it would ‘do’.

Understanding
causality is
about
reflecting on
effects as
much as
about
categorising
causes.

Figure 1: A case study in causation

Was it the straw that broke the camel's back? Read the story that follows and produce a reasoned analysis of the causes of Alphonse's death making use of as many cause categories as possible.



Once upon a time there was a camel (called Alphonse). For various reasons (relating to an unfortunate accident during his birth) the camel had severe back problems. This was not the end of his misfortune, however, because he had an evil exploitative owner (called Frank the Camel Killer) who regularly overloaded his camels prior to taking them on gruelling and totally unnecessary round trips up and down mountains on his way to deliver goods to his customers. These customers, shockingly, were completely indifferent to these frequent and gross violations of the rights of camels and found Frank and his antics at least vaguely endearing.

Well, one Friday, Frank had just finished loading-up Alphonse and his poor exploited fellow creatures for yet another gruelling and totally unnecessary round trip up and down the mountains. He had piled and piled and piled up the goods onto Alphonse's back and was taking a break and reflecting smugly on his handywork, chewing a straw. On a whim he decided to add the bedraggled straw he had been chewing to Alphonse's load. Alphonse groaned obligingly. He eyed his owner with disgust. He keeled over and died of radical and irreversible back collapse.

The problem was, as you probably already suspect and as I certainly found, that it would ‘do for’ students in a very different sense. I might have developed a useful typology, but would that enable the students to start to evaluate causes in a more sophisticated manner? As I launched into one of my first lessons on causality, I was experiencing a smug glow that I ought to have learned to recognise – the teacherly feeling that comes from cooking something up to your own satisfaction, without worrying overly much about any one else’s tastes or nutritional requirements. My cause lesson was well on the way to the doghouse when it was saved by a student.

Buckaroo

(or triggering causal understanding)

‘It’s like Buckaroo!’ announced Anthony, a student who just could not sit still – not literally, not metaphorically – part way through my expository assault on trigger causes. I had no idea what he was talking about, although it turned out that the feeling was not mutual. Anthony started to explain Buckaroo. I still did not know what he was talking about. He suggested drawing a diagram on the board. The lesson came alive. In Buckaroo, players add equipment to various parts of a donkey whose hind parts are sprung. At some point, determined by the weight that is already on the donkey and by where it has been placed, the donkey bucks, scattering the pieces that have already been added and (presumably if the mood takes you) you start all over again. Anthony’s explanation was much more entertaining than mine. Buckaroo certainly made sense of triggers. It also triggered a discussion in which students started talking about preconditions. Other students added ideas of their own and analogies started to flow. Some of the analogies lost me and some of them lost everybody (there was one, for example, about apples in a barrel that was the last word in incomprehensibility and became a standing joke for the rest of the year). The important point was this: the students had started to enjoy the ‘cause’ lesson and to enjoy using the typology. It wasn’t my cause lesson anymore, it was theirs. Whatever else it was, Buckaroo was probably ‘sufficient’.

I decided to follow up the discussion of Buckaroo in two ways and designed a worksheet that delivered both. It contained a series of comprehension questions to build understanding of the terms in the typology and it also contained a number of absurdist case studies (see the example in Figure 1). The humour – which seemed to work – largely consisted in the students laughing at my attempts to be funny.¹¹

Camels and counterfactuals: accessing concepts

‘The true historian, confronted with a list of causes... would feel a... compulsion to reduce it to order, to establish some **hierarchy** of causes which would fix their relation to one another, perhaps to decide which cause, or which category of causes, should be regarded, in the last resort or in the final analysis, as the ultimate cause.’¹²

This is a worthy injunction no doubt. It was certainly one I was paying attention to, not least because it was reproduced at the start of the Unit Two commentary in Edexcel’s Teacher’s Guide.¹³ The average student and not a few history teachers, of course, prefer to regard a list of causes like a catechism – to be committed to memory and eventually, perhaps, to paper, in some sports hall or other in May or June. But how can we help students begin to sort, to assign importance, to rank and to order? These were the questions that I had started to deal with by constructing the typology, but that, in itself, wouldn’t get anyone very far (labelling is ordering but it is not necessarily evaluating). Buckaroo had started to help us. I now turned to Evans’ use of the conditional (‘if A had not happened, then B **probably** could not have happened’ and so on) and began to pose some counterfactual questions in order to move the students on further. I had just been reading Niall Ferguson’s *Virtual History*¹⁴ and ‘what if?’ was a favourite question at the time. One argument in counterfactuality’s favour – that the counterfactual question was a respectable one that in fact tested understanding of the implications of what was the case better than most others – particularly appealed to me. I started to pepper my lessons with them. Ferguson was right – if you did not understand the implications of the facts of a situation you could not get anywhere with ‘what if?’ questions and, as it turned out, asking such questions was a good way of starting to think about such facts of a situation.

Rough diamonds

So far, I had a typology and I had exercises all aimed at making causal reasoning challenging and enjoyable. The key issue remained however: how to promote *evaluative* thinking. Students needed to approximate to Carr’s ‘final analysis’ or at least to begin to generate hierarchies. In other words, the evaluative terms in the typology (such as the ‘Importance’ category) had to be made to do some work.

I had a number of ideas¹⁵ and I liked messing around with bits of paper. I was looking for something that would allow students to model their ideas and debate and compare them with each other. If I wanted them to engage in critical thinking about cause, then the best thing, it seemed to me, was to construct learning

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Figure 2: Instructions for a 'diamond nine'

The Causes of the Revolt of 1857

INSTRUCTIONS

1. Complete the 'Analysis of Causes' grid using your notes and web resources. To do this you need to do two things:
 - (a) You will need to add at least two causes of your own.
 - (b) You will need to identify at least one consequence for each cause.

You can go further – it may be that you come across factors that you want to substitute for those I have identified.
2. Complete the 'diamond nine'. The idea is to place the causes you consider to be most important towards the top and the least important towards the bottom. Do this by dragging and dropping the diamonds with your mouse.

You can do many other things if you want to – it might be that you feel that a diamond is too constricting and that you want to use another shape or add arrows to show links....
3. Be prepared to defend your analysis and to present it to the class. You must be able to give reasons to support your case.

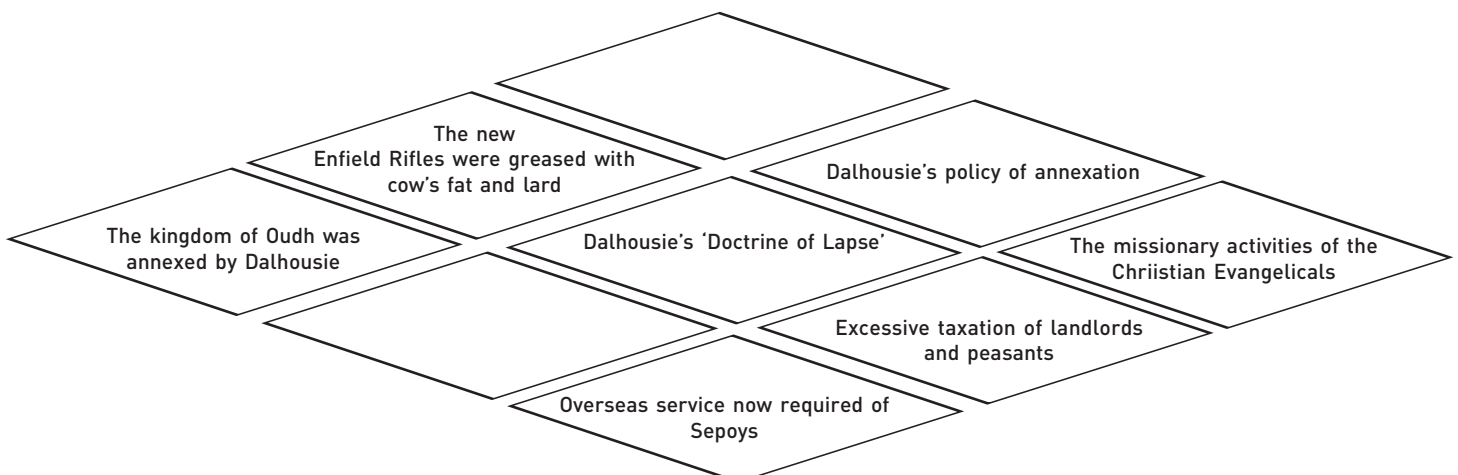
Figure 3: Causes and consequences chart

The Revolt of 1857: Analysis and Causes

Cause	Consequences
In 1856, the kingdom of Oudh was annexed by Dalhousie.	
The Rani of Jhansi was not allowed to adopt a son and her lands were taken over by the EIC (Dalhousie's 'Doctrine of Lapse').	
The new Enfield Rifles were rumoured to be greased with cow's fat and lard.	
The missionary activities of the Christian Evangelicals had expanded constantly since they were legalised in 1818.	
In new enlistment regulations issued in July 1856, overseas service was made obligatory on all new Sepoy recruits.	
The practices of Sati and Thugi were attacked under Bentinck's governor generalship.	
The EIC prospered by raising taxes and by monopolising trade.	

Figure 4: Example of a 'diamond nine'

The Causes of the Revolt of 1857



experiences that would encourage, or, even better, necessitate, discussion and debate. At first I tried paper solutions and a number of excellent analyses emerged from this process – in one case a model seeking to explain aspects of slavery that literally had (paper) chains of causality stuck to it linking factors together. The students produced display analyses in groups, presented them and debated them and, eventually, marked each other's work. Criteria included things like the number of categories that were deployed, the extent to which space had been used to indicate relative importance and the extent to which the inter-connections between causes had been made apparent. This approach was used to work on essays with imperial themes such as the essay on the abolition of slavery referred to above and on other courses. The work of constructing these analyses was often also a research task – they were finding out 'the facts' and processing them conceptually at the same time (which is to say that their research had focus and that the facts – possibly – had meaning).

So far, so good – or so it seemed. The problem was, however, that students still seemed to stumble over 'Importance' categories – the acme of causal analysis according to Evans, Carr and Edexcel. The root of the problem was the drive to categorise and label. Attention needed to be shifted away from causes and towards consequences.

A solution is illustrated in the figures that follow. For various practical reasons I had to come up with credible ICT resources. It was at this point that I remembered the 'diamond nine'. It is a good sorting exercise in which nine small diamonds are rearranged into a larger diamond in which relative position is used to indicate importance. It is also an exercise that can be very easily adapted to ICT in a way that considerably improves upon the paper original.¹⁶ The exercise has a number of advantages. The geometry means that the diamond has to have points and this makes fudging difficult. It also encourages reflection on horizontal as well as vertical relationships (or about relations between factors as well as about hierarchies of factors). It has some disadvantages as well, of course, not least the tacit assumption that historical events have nine causes and that they fall into neat patterns (in which there is always one most important, one least important, three of equal middling importance and so on).

So far, the digital 'diamond nine' (see Figure 4) does not go very far towards solving the 'importance' problem. The table reproduced in Figure 3, however, does, at least when combined with the use of counterfactual questions. The table makes students specify the effects of causes *before* they move onto the modelling task that is reproduced in Figure 4. Precisely for this reason, it enables counterfactual

thinking – to think counterfactually is to eliminate effects and to consider what follows if this is done. My input, during the text-box sorting element of the exercise, largely amounted to repeating a double-barrelled question something like this: 'Tell me about the consequences of this cause and then tell me how the situation would have been changed if we imagine the cause away?' We have seen that Evans uses conditional phrasing to explain 'importance' categories. Once students have clarity about effects, they can start to think evaluatively. Or at least, they can start to think meaningfully about counterfactual questions, a skill that is probably a necessary condition for the kind of evaluative thinking that enables the construction of hierarchies.

Boxing clever (or making sense of 'mutiny')

How effective is all of this? Although my evidence is anecdotal and impressionistic, an analysis of students' work suggests that my Year 12 students are, on the whole, much better at analysing causation than Year 13 students used to be under the old system. No doubt this was because they knew what they were doing – they knew there was something called causal analysis, they knew quite a lot about how to do it and they could talk the talk.

An example of the kind of work I have come to expect is reproduced in Figures 5 and 6.¹⁷ The 'Indian Mutiny' presents a number of conceptual problems and has generated an extensive historiographical debate. There are, *inter alia*, nationalist interpretations that attempt to incorporate the events into a nationalist narrative, explanations, widely favoured by the British at the time, that emphasise mutiny and try to limit discussion to the military, and revisionist interpretations that emphasise diversity and raise questions about the term 'Indian'. Work on the causes of the Mutiny was preceded by work on definitions and on the identity of the event – work that asked questions like 'who was involved?' and 'how does this affect the label we should put on it?' There were a number of ways in which students could take the diamond. Jenna's approach is interesting, not least because of the range of concepts it uses. It also shows how the diamond can promote abstraction and synthesis. Her 'underlying' cause ('westernisation') is a synthesis and summary of a common feature of a number of the other more specific causes (such as the policies of Bentinck's Governor Generalship). This is a sophisticated analysis by any yardstick and it is clear from the cause and consequence table how the ranking modelled on the diamond has emerged. Imagine most of the causes away apart from westernisation and you probably still have the outcomes of 1857/8 – perhaps not at that precise time and perhaps in a different form. Roughly speaking, it doesn't get better than this.

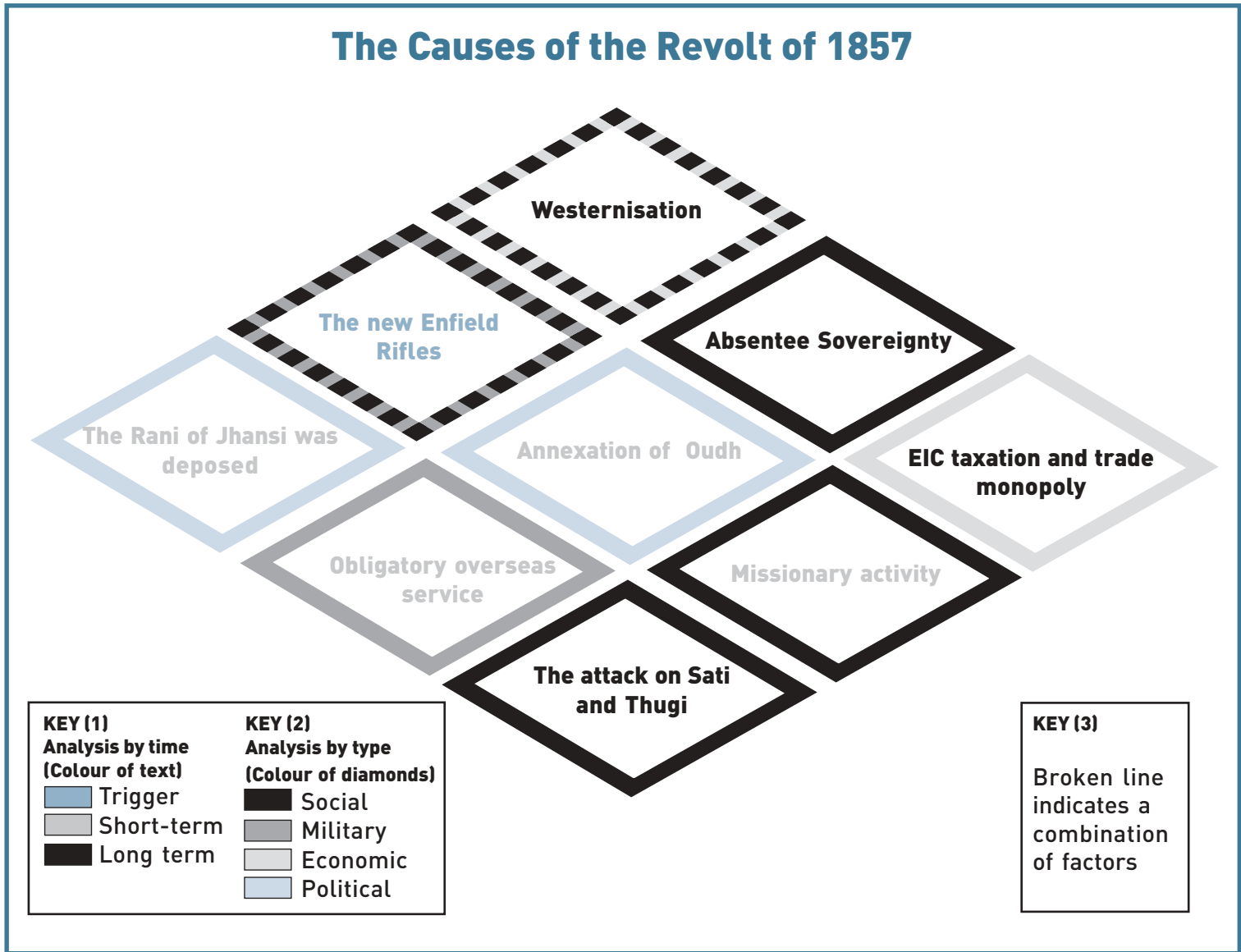
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Figure 5: Jenna's completed chart

The Revolt of 1857: Analysis and Causes

Cause	Consequences
In 1856, the kingdom of Oudh was annexed by Dalhousie.	Anger at the land being taken – stirred population up against English – new laws – not favourable towards Indians. Anger at increasing control England was taking over India – therefore growing anger and resentment towards English in India – particularly area of Oudh.
The Rani of Jhansi was not allowed to adopt a son and her lands were taken over by the EIC (Dalhousie's 'Doctrine of Lapse').	Anger at 'Doctrine of Lapse' – ignoring power of rulers and influence they had. Anger from rulers – who had power, money and respect, and also Doctrine of Lapse allowed English to take control – could enforce laws unfavourable to main population – anger and fear at measures to be taken.
The new Enfield Rifles were rumoured to be greased with cow's fat and lard.	Offended their religious beliefs – high caste Indians and muslims -- they were disbanded and punished severely and felt disgraced by English. Already anger at change in uniform – change in pay etcetera – therefore it acted as a trigger for action.
The missionary activities of the Christian Evangelicals had expanded constantly since they were legalised in 1818.	Anger – thought English would completely take over – favourable policies to Christians. Worried about other additional action British would take. Offensive to Indians – as Evangelists criticised native Indian religions. Created further feeling that English believed themselves to be superior to Indians.
In new enlistment regulations issued in July 1856 overseas service was made obligatory on all new Sepoy recruits.	Become less holy when away from India – and therefore wanted extra pay which was denied – anger at change in regulations. Ignorance of culture – which created further friction between sepoys and English.
The practices of Sati and Thugi were attacked under Bentinck's governor generalship.	Attacking traditional Indian way of life – additional anger in areas in which Thugi and Sati were more practised – changing traditional rules related to Indians – but also possibility that English would rule out other laws related to other religions – which seemed to be the situation with the Enfield rifles.
The EIC prospered by raising taxes and by monopolising trade.	Put pressure on peasants – land was seized if in debt – put peasants in an even worse situation – disliked English profiting from their misery. Monopoly in trade affected Indian business and affected peasants and upper class alike.
Absentee sovereignty.	British were seizing power without considering impact on the local populace – greatly disliked, caused a broad social base to become involved. Enforced laws which ignored cultural differences between England and India. With tensions rising it was difficult for English to diffuse situation – as could not see subtle changes – could only take action when atrocity had already started.
Policy of Westernisation.	Generally underlying issue – all going towards creating a westernised state – religion- missionaries. Ignoring cultural and religious beliefs. Ignoring past rulers and their power. Made Indians feel – as if British thought they were superior – anger at action. Connects with absentee sovereignty – did not consider outcomes of actions – and when mutiny occurred were not there to stop it. Westernisation angered ordinary people – were made to feel inferior to English.

Figure 6: Jenna's completed 'diamond nine'



REFERENCES

- ¹ For example, see Roberts, M. (2003) 'AS/A2 History' *Past Forward*, Historical Association. More generally, see Ann Hodgson and Ken Spours' critical assessment in *Beyond A Levels: Curriculum 2000 and the Reform of 14-19 Qualifications* (2003).
- ² See my article in the previous edition (Chapman, A. (2003) 'Conceptual awareness through categorising: using ICT to get Year 13 reading,' *Teaching History*, 111, *Reading History Edition*) for more of my thoughts on developing conceptual awareness amongst post-16 students.
- ³ Important concerns about narrowness and its consequences and about the role and importance of history in combating it were cogently expressed in the report of the Runnymede Trust's Commission on the Future of Multi-Ethnic Britain (October 2000) published just as Curriculum 2000 delivery was beginning. (See <http://www.runnymedetrust.org/meb/TheReport.htm>).
- ⁴ See Denis Shemilt's lucid arguments for the importance of large scale historical frameworks in Stearns et al (eds) (2000) *Knowing, Teaching, and Learning History: National and International Perspectives*, NYU
- ⁵ This is, of course, a highly tendentious description of the events of 1857/8 (see, for example, Stein, B. (1998) *A History of India*, Blackwell)
- ⁶ For example, the idea of 'educating' another culture in 'universal' values – a staple of Victorian liberalism – has recently had a considerable revival as students were not slow to notice. The whole question of slavery and its consequences was recently revived in the public mind by the debate on reparations at the UN conference on Racism at Durban in September 2001 (<http://news.bbc.co.uk/1/hi/world/europe/1522519.stm>)
- ⁷ See Phillips, R. (2002) *Reflective Teaching of History*, Continuum pp48-49 for a useful list of such exercises. The link between concrete modelling and written analysis is discussed in Haydn, T. et al (eds) (1997) *Learning to Teach History in the Secondary School*, Routledge pp104-105 and in Husbands, C. (1996) *What is History Teaching*, Open University Press, pp107-109
- ⁸ Phillips, R. *op.cit.* p42. See also Ferguson, N. (ed) (1997) *Virtual History: Alternatives and Counterfactuals*, Picador.
- ⁹ Project CHATA's findings suggest that many 11-14 students are equally 'used' to this idea. See Lee, P. 'History in an information culture', *International Journal of Historical Learning Teaching and Research Vol 1 No.2*, especially p5.
- ¹⁰ Evans, R.J. (1997) *In Defence of History*, Granta pp157-158.
- ¹¹ 'The Camel Sheet' has become student shorthand for causal analysis – possibly an ambiguous compliment.
- ¹² Carr, E.H. (1961) *What is History?*, Macmillan, as cited in the Edexcel *Teachers Guide* (2000).
- ¹³ Available at <http://www.edexcel.org.uk>
- ¹⁴ Ferguson, N. *op. cit.*
- ¹⁵ Not least as a result of hearing Christine Counsell outline the ideas – subsequently published in Counsell, C. (1997) *Analytical and Discursive Writing at Key Stage Three*, The Historical Association – in her address to the Historical Association Education Conference at York in 1996.
- ¹⁶ Figures 2 to 6 were constructed in very simple ways, by importing a scanned image into word and by using the drawing tool bar in word to construct the diamonds and to set the image as a watermark. Dragging and dropping allows the diamonds to be moved around and sorted. The drawing toolbar (and in particular the instruction 'format text box') can be used to do some very interesting things (see the example of student work in Figures 5 and 6). It is a good vehicle for ICT group work and it is also adapts well to presentation and class discussion (particularly with a data projector). The digital version probably has the edge on the paper version because less time is wasted cutting up paper and because it can be used, reused, revised, saved, printed, projected and so on.
- ¹⁷ This analysis was produced early in the first term of the A2 without any explicit reminder of the terminology that had been introduced at AS.