

Subject spotlight: EPQ

This week has seen the launch of the Extended Professional Qualification (EPQ) to selected Year 12 students. This additional A-Level empowers students to complete detailed research into an area of particular interest, developing key academic skills, that will support their post-18 aspirations.

Launching the EPQ is always a fascinating time, as it allows us to understand the interests of students, see their motivation about specific topics, and watch as their academic curiosity develops through the project.

We have had an array of topics over recent years, ranging from 'The role of Magna Carta in 21st Century Britain', to 'The legal implications Cryptocurrencies', and a breadth that has considered 'The Implication of British Nuclear Policy', through to 'Reasons for the declining bee population in Northampton'.

Below are a few extracts from recent EPQs, where the excellence of our students once again shines through:

How effective is the Buckminsterfullerene in treating cancer?

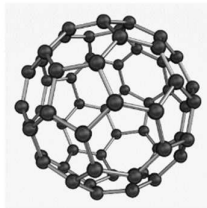
Introduction:

Using the Buckminsterfullerene (C₆₀ fullerene) for the treatment of tumours is one of the most promising candidates for future cancer treatment. In particular, the Buckminsterfullerene has a potential use in phototherapy, which is a form of cancer treatment involving the use of light and a light-dependant drug. Many experiments and a lot of research have been carried out to prove its effectiveness in cancer therapy. However, there are still some disadvantages to the molecule, holding back its use in current cancer treatment, which will be highlighted throughout the report. This report focuses on the comparison between the C₆₀ fullerene as an antitumour agent and the use of chemotherapy and radiotherapy for cancer treatment.

What is the Buckminsterfullerene?

The Buckminsterfullerene (Bucky Ball) is a spherical fullerene molecule with the formula C₆₀. It has a cage-like structure (truncated icosahedron) which resembles the shape of a football, made of 20 hexagons and 12 pentagons (Figure 1). Each carbon atom forms 3 covalent bonds (bonds between 2 or more non-metals) with other carbon atoms.¹

Figure 1- structure of C₆₀



Alphy Dennees looked into the efficiency of a new method of cancer treatment, the Buckminsterfullerene.

Tom Vaughan investigated the manner in which Satan is portrayed in Milton's *Paradise Lost*.

Abstract

Paradise Lost has, since its 1667 publication, proved to be deeply controversial. It is generally accepted as one of the greatest literary achievements in the English language, with a unique ability to incite the passions of its readership, and there is none more passionate than the figure that dominates the first two books and a great deal of the wider poem. Satan is passionate and introspective, with an intense desire for that which he perceives to be liberty. He is also vain, ambitious and delusory. Milton requires the readers of his poem to identify the negative facets of the Devil's personality and use that knowledge to adjust the lens through which the work is received. Failing to do so would disregard the literary ambitions of the poet, as occurred first with John Dryden and then subsequently with certain Romantics. As time passes, and society becomes increasingly secular, the careful balance established by Milton's literary authority is destabilised, and the modern readership has a greater tendency to identify with a supposed heroic Satan. Ultimately, however, the criteria with which to judge the Devil's heroism must be defined by Milton's own belief system. Satan cannot be a hero because the notion does not align with Milton's philosophy, which can be clearly seen in *Paradise Lost* and Milton's interaction with the classical epic poetry of Homer and Virgil.

The politics of Rome itself was complex, however these constitutional intricacies did not cause difficulty themselves for the Republic, not least until weaponised by aspiring generals and scheming politicians. The death of the Gracchi brothers and the ensuing political crisis were the first major example of this effect, but they were certainly not the last. Not only did their deaths spark more violence in the forum, but also highlighted the aforementioned issues of *ambitio* and the deep-rooted divide between the *Populares* and the *Optimates*. What the Gracchi had tried so vehemently to reform was an issue which had begun to plague the citizen farmer for many years. The consolidation of land into large, private estates was damaging to this class of citizens and subsequently the Republic and inspired many of the other factors which contributed to Rome's collapse, such as the Marian military reforms. Growing debt, the landless peasants, and the generals who seized these opportunities to enact their own reforms and establish their personal authority had not been a feature of Roman life previous to the crisis but not make up much of the discussion over the state of Rome in the post-Gracchan years. These factors had been chipping away at the integrity of Rome's politicians, the safety of its people, the peace in its capital and the strength and unity of its society, and in 49 BCE culminated into what was the most significant event in Rome's collapse.

Upon marching on Rome, Caesar had sealed the fate of the Republic. Just as without the means by which Caesar could manipulate the Republic and establish himself dictator for life his Civil War would have meant nothing, without the war itself it is doubtful whether the Principate would have been established, most definitely at the time that it did. Certainly, the social, financial, and political factors explored in this essay had contributed to the declining state of Rome in important ways, and likely without one the others may not have carried the same impact. However, the fate of the Republic was, in its final years, at the mercy of the most powerful general of its time; Caesar gamed the systems of the constitution, weaponized previous reforms of the military, took advantage of social strife and financial inequality, motivated by pride and his *ambitio*. The culmination of these contributing factors lay in his destruction of the status quo. Ever evolving and shifting conventions had ultimately been destroyed, and upon dealing a fatal blow to the Republic's system of functioning, Caesar's dictatorship was the most significant event in its decline.

Here, Ben Wilcock is concluding his work about why the Roman Empire collapsed.

And Sam Dhir's study into the implications on dentistry caused by the lockdowns during the Coronavirus pandemic also made for fascinating reading.

The enforced closure of all non-emergency dental practices had resulted in a significant shortage of dental practices across the UK. Since the shutdown of UK dentists on the 25th March 2020, regional health teams set up a total of 219 Urgent Dental Centers (UDCs) by May 2020¹¹ to treat those patients facing severe dental emergencies. The availability of UDCs in providing emergency dental care alleviated the further compression on Accident & Emergency Departments for dental problems in patients.¹² Due to the precautions in place to protect patients and clinicians during Aerosol Generating Procedures (AGPs), the UDCs could only collectively treat 3,500 – 4,000 patients a day in order to adhere to the Standard Operating Procedures (SOPs) document outlined by NHS England sent to all practices on 31st March 2020.

When we look at a typical dental practice like The Borough Dental Practice in Hampshire (UK), this practice triaged patients via telephone and saw an increasing number of patients reporting pain and discomfort due to routine check-ups being temporarily discontinued, preventing dentists from intercepting early dental problems. On average 6 patients per day contacted this practice for urgent treatment which would equate to 133,300 patients across the UK (based on the UK's demographic number which is approximately 67.9 million) needing treatment during the initial shutdown period.

With such an array of interesting topics, it is no wonder that the launching of the EPQ brings a level of excitement! I am certain that this year, we will have not only a huge range of topics, but a cohort of students who are eager to demonstrate their academic excellence.

J Marshall

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