THE TREASURE HUNT BEGINS

So we start at St Chad's in Shrewsbury.

Make the short journey to the tower nearest where Abraham Darby the Elder (AKA Abraham Darby I) set up his first brass works. (Resources you would have needed - Dove's guide (For those of you who haven't tried it, Dove's guide online is a fabulous resource https://dove.cccbr.org.uk/) and Google)

Put Abrahm Darby the elder into google and you find https://en.wikipedia.org/wiki/Abraham_Darby_I Abraham Darby the elder (AKA Abraham Darby I) built his first brass foundry in Shropshire, with others, at Coalbrookdale. The nearest tower is Holy Trinity Coalbrookdale. (Coalbrookdale was one of the quiz answers). If you go to Dove and look up Coalbrookdale you find the answer to the first question.

- How many bells in the tower? 10
- What is the fundamental difference between brass and the metal used for making bells? Both are alloys of copper but brass has zinc and bell metal bronze tin. Please see text from Peter Woollam on the next page. Peter is an engineer and Diocesan bell adviser.
- Which Abraham Darby was responsible for building the current church? It was Abraham Darby IV after converting from Quakerism to Anglicanism. https://www.coalironlitt.co.uk/our-churches/holy-trinity-coalbrookdale/ https://en.wikipedia.org/wiki/Abraham_Darby_IV

Now let's travel South East to the church with ringable bells nearest to where Pickles the dog found the world cup. (Resources needed: Google and Dove's guide) Pickles was one of the quiz answers.

Pickles the dog found the world cup in Upper Norwood https://en.wikipedia.org/wiki/Pickles_(dog) on Beulah Hill. Beulah Hill is a long road and so to answer the next question you had to find this map or similar https://www.google.com/maps/search/churches/@51.4149425,-0.0933062,16z

Once you had established precisely where Pickles found the trophy, you then need to go to Doves Guide and enter the name of a place. Upper Norwood seems obvious.

Then all is lost! There is no entry for Upper Norwood. You then enter Norwood but you end up miles away from Beulah Hill!

Nil desperandum!

Move the map from Dove around at lowish power until you find Beulah Hill (it's a road with a characteristic shape with equally characteristically shaped areas of green nearby). Then go in at higher magnification until you can recognise the spot where the trophy was found. All the time Dove shows you where the churches are, adding and removing as you move the map around and in and out.

Once you have pinpointed the place where the world cup was found you find you are near the centre of a triangle made up of the towers at Streatham, Croydon and Penge.

What is the church? (Clue: It is close to a famous athletics stadium and the scene of John Mortimer's barrister's most memorable case)

The nearest tower (just) is St John the Evangelist, Penge. The stadium is at Crystal Palace, and Rumpole of the Bailey' s most famous case (at least to him) was the Penge bungalow murders. https://en.wikipedia.org/wiki/Rumpole_and_the_Penge_Bungalow_Murders

- Who cast the 6 bells and when?

Click on the tower symbol for Penge and then click more and "voila, zee little grey cells" have led you to the information you needed, the bells were cast by John Warner and Sons in 1876

Peter's piece

"Thanks to Tony for keeping us occupied with his quizzing. I guess that his purpose is to keep us informed, educated and entertained, thereby upholding the motto of the Bell Bonging Community.

I admit that I'm finding some of the questions difficult and I suspect he has a cunning plan. Are we meant to feel so mentally challenged that, when this crisis is over, we'll be relieved to face the rather simpler task of learning the blue line of a new method?

Anyway, I was prompted to write by the question about brass and bronze alloys in Part 1 of his Virtual Bell Ringing Treasure Hunt of the World.

Bells have featured in worship in the Christian Church since the 5th century when Italian monks revived the ancient knowledge of bell founding that had been developed in China as early as 2000BC (some sources say even earlier). Today, bells are cast in the same bronze alloy of copper and tin as then in the approximate ratio of 4:1, so the Chinese certainly got that right. Very small quantities of other elements are also present to improve the finished material's properties. This is a much higher tin content than is found in other engineering applications, e.g. ship's propellers or bearings.

So why bronze? Copper and tin are both expensive - £3,920 and £11,985 per metric tonne respectively today on the London Metal Exchange (sort of the eBay for global trading of engineering raw materials). Steel, by comparison, costs of the order of £320 per tonne.

Bell founders pay handsomely for redundant bells sold as scrap for melting down and recasting - the most recent figure I have is that Taylors were offering £325 per cwt. Let's put that into perspective by imagining a village church with a ring of 6, tenor about 7cwt. The scrap value alone of these bells is about £9,500. No, no, no! I'm not suggesting that any of our churches should …….

So what are the qualities of bell metal that are so valued? We want something that is resistant to corrosion and is strong enough to withstand the repeated blows of a heavy iron clapper. But if iron is good enough for clappers, why not for bells as well? The Victorians tried using steel and we have one in our territory – the single bell at St Mary Magdalene, Battlefield, Shrewsbury, cast by Naylor Vickers at Sheffield in 1861. But have you ever heard steel bells ringing? They sound rather as you'd expect – like rusty buckets! By the way, I've never heard the Battlefield bell being rung. Does anyone know of a protocol for its use?

Bell metal produces a far better tone – actually I prefer the word timbre in this respect. But it has another important quality. Get close up to a bell (the bigger the better) and strike it. The sound persists. In some cases you can still hear it humming after as much as two minutes. Bell metal has the longest reverberation time of any known material.

And there's a bit of a conundrum hiding here. Bells are cast by pouring molten metal into a mould. Pure copper melts at a temperature of 10840C and tin, in rather sharp comparison, at a mere 2320C. So what's the melting point of bell metal? To understand this, you'll need an introduction to that branch of engineering called Metallurgy. Any account is much too long to give here but, if you're intrigued by the question, I suggest that you go to www.uefap.com/reading/exercise/ess3/alex2 . *(NB: this link has been troublesome and you may find that the link takes you to a page about 'Using English for Academic Purposes'. Don't worry – you're in the right place! Follow the menus on the left-hand side of the page to Reading, Exercises, Strategies, Chemistry, Metallurgy: Making alloys.)*

The presentation could be better and I'm sure there are other such web resources, but the explanations given in this one are fairly straightforward to understand.

Go on! Look it up. Don't pretend that you've got anything better to do whilst you're locked up."