

What do we mean by A=415?
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It sounds a silly question, “What do we mean by A=415?”, but it does need an answer, and it’s a question that any of us who build instruments, any of us who tune instruments, and any of us who are interested in temperaments must answer. What’s more, judging from some conversations I’ve had recently with friends who do various of these things, it’s not a question that anyone has really sorted out the answers to.

The point is this: Our standard reference pitches are all based on A, 440 Hz for modern pitch, 415 Hz for the commonly accepted but basically pseudo baroque pitch, 392 Hz for one of the real baroque pitches (Hotteterre etc; the rest of the baroque was anything from there – it wasn’t often too much lower than that – up to about 415-418 but mostly somewhat lower than that, around 408-10, which we sometimes call Bressan pitch for easy reference), 461-465 Hz for some of the renaissance instruments (which nowadays often gets called Marvin pitch from one of its strongest adherents in making reproduction instruments), and so forth.

However, surely nobody ever tuned an instrument from A, neither now nor in the historical periods. If you start tuning a harpsichord from A in any historical temperament, you’ll get some very funny intervals in the more common keys, and the meantone wolf will start howling in unexpected places. One tunes from C (or maybe from F – that’s one of the points that has made me ask this question, as we’ll see below) just as a piano tuner does today (he uses a C fork at 523.3 Hz, an equal-tempered minor third above the international standard of 440 Hz – at least he does if you brow-beat him into it; otherwise he either tidies the thing up from wherever it’s got to under the influence of your central heating, without checking its actual pitch, or else he tunes it nice and sharp to make it sound more brilliant, just as too many orchestras are doing nowadays – we’re well on the way back towards the mid-19th century High Pitch).

The real question behind that in the title of this Comm is how do we find that C or whatever base note we are going to use? Do we start on 415 Hz (let’s take that pitch as our exemplar), and

- a) go up a minor third to C in the temperament we are going to use, and work from that?
- b) Or do we go up to our modern equal-tempered minor third and start on C 493.9?
- c) Or do we go up to whatever C that will produce, by the time we have got round to the A in our cycle of fifths in whichever temperament we are using, an exact 415 Hz for the A?

The third of these, (c), would seem to be the most logical; our A will then really be 415 Hz, and if the ensemble is cuckoo enough to use an A as a tuning pitch (a D is much more logical as a tuning standard for almost any ensemble of early instruments; we settled on a D in *Musica Reservata* when we found that that was the note common as a good note to the largest number of instruments, whereas hardly anybody had a good A), that tuning pitch will actually be the one that we have agreed to use. However, it’s hell’s delight trying to cope with the maths (for an innumerate character like me) to work out in quarter-comma, or Werckmeister 3 (or any other Werckmeister number for that matter), or even Pythagorean or anything else, what pitch I need from C in order to wind up spot-on 415 at A. And if I want to vary my starting point (and I am convinced that in the old days people shifted the wolf – and the dirtier thirds or fifths – away from where they’d be a nuisance in the key of ‘this’ piece by doing just that, by altering the starting point of their cycle of fifths), then it gets worse, because I still need to wind up on A, whether A is now the supertonic or the mediant or whatever, spot-on 415.

The first of these, (a), is attractive in theory, but somehow I don’t think it ever happened that way. We would be starting on a C which had no historical foundation (ie which never existed)

because I don't think they had A tuning forks, and I don't think that they used A as a reference pitch. I suspect that the main reason that we do use A is that it's the only open-string note on the modern string band that an oboist can play with one hand while holding a fork to his ear with the other (which is standard practice in a lot of orchestras). The only other reason that I can think of is an idea that one should start at the beginning of the alphabet, presumably under English or German influence (la isn't the beginning of anything, whether you're thinking in French, Italian or Hexachord).

I suspect that (b) is what WE really mean by A=415; that we mean, as Alan Davis pointed out to me, that the pitch we want is an equal-tempered semitone below modern pitch, and that just as 415.3 is a semitone below 440, so 493.9 is a semitone below 523.3. The snag with that solution is two-fold:

- i) again that we wind up with some rather funny looking figures for our C or whatever, and,
- ii) much more seriously, that we never get back to 415 when once we have set our temperament (unless, of course, we are using equal temperament, in which case we don't need to bother with any of these questions anyway).

If I am right and that (b) is really what we mean by A=415, what we are saying is that we don't mean A=415!

My own interest in this question is both in setting historical temperaments on keyboard instruments and, more importantly, trying to work out what basic pitch and what temperament an instrument maker had in his mind when he was making an instrument and tuning its finger holes. We can produce tables of this note so many cents up, the next so many cents down, and so on and so forth (you'll find such tables on some of our Bate Collection plans), and one can analyse these tables (which is what I'm trying to do), but it gets very difficult unless one can agree on a logical starting point.

Hence this Comm. I'd be very glad of opinions and reactions from any of you who have ideas about this. I have sent out advance copies of this to a few of you who I know are interested in this area, and there are some responses in this Q on this subject (a mini-symposium; what's the written equivalent of a colloquium? A conscription sounds wrong!). Do please send me your opinions, also; they will be valued, and if we can establish a consensus of opinions it might be very useful, and not just to me.

PS I have not altered this Comm in response to some of the replies I've had, even where they have corrected me on such points as the survival of an early A fork (my only 18th century fork I take to be a C; it produces 244.8 Hz, and I don't believe in a B natural fork (it looks too old to be a very high-pitch B \flat), and the fact that A does make a good centre for keyboard tuning.

The responses so far have all been from the keyboard side. This is important, too, as I've said above, for wind instruments, especially in trying to work out what the maker was aiming at. It is only on wind instruments that we have concrete evidence (as distinct from written descriptions) of temperaments. We sometimes say that an instrument is built out of tune; is it, or is that what the maker intended it to produce, in a temperament we no longer use? Unless we have some idea of where he started, it's very difficult to work out which it is.