Tuning and Temperament
by Edgar Hunt

One of the problems which the harpsichordist has to face even before he can play his instrument, is tuning. Much has been written already in these pages about some of the finer points in relation to the archicembalo and the fretted clavichord, but in this article we shall attempt to explain some things in simpler terms.

The basic problem is the conflict between intervals which sound well in tune, and the musician's need to be able to play in as many keys as possible. It is usual to tune in fifths and octaves, working round the cycle of fifths until one reaches B sharp which should hopefully match the C with which we started. But if we have been tuning perfect fifths - all sounding clear and bright like a violinist tuning up - that B sharp will be sharper than our original C, and the E at which we arrived after tuning C — G — D and A will sound much too sharp when we try to use it as a third in a C major chord. So compromise is needed, and to arrive at equal temperament, the difference between B sharp and C, the comma, is divided by twelve and each fifth is made smaller by that fraction. The fifths loose their brilliance but are not unpleasant, but the major thirds are still rather too sharp for real comfort, but if one wants to play in C one moment, and switch to D flat or some other remote key the next, it's another compromise that modern musicians have to live with.

It was not always so. In the Middle Ages music moved in fifths and octaves and kept within its system of modes. The fifth could be tuned perfect, but the third was treated as a dissonance. One can imagine these fifths and octaves rolling round a cathedral in all their perfection and picking up all the resonances of the building.

Baroque composers were on the whole content to keep within reasonable limits — say three flats to three sharps. They were more concerned with chamber music, so their fifths could be made rather smaller - they still did not sound badly out of tune, but the thirds were greatly improved. If we want to relish the full flavour of Baroque music we have to go back to the time when some semitones were more equal than others and there was very little difference between a major and a minor third when both were really in tune. For this we must cultivate a form of unequal temperament or mean-tone tuning.

With the chromatic ideas of the nineteenth century and the twelvetone scale of the twentieth, semitones had to be made equal, leaving everything out of tune, except for the octaves.

This has been a gradual process. Lutes and viols were probably the first to be affected on account of their frets which had to serve equally as far apart as F and A in the case of the lute and tenor viol — C and E in the case of treble and bass viols. Thus equal temperament was known at least at the end of the sixteenth century. On the other hand the final change from mean-tone the equal temperament was much later that many people realize. The writer's father who was a chorister at St. George's Windsor under Sir George Elvey, was brought up on mean tone. The organ there was not tuned to equal temperament until after Sir Walter Parrett succeeded Elvey, in 1883. At Bristol Cathedral the change was made in 1867. At the Temple Church the organ remained in mean tone so long as E. J. Hopkins was in charge (until 1898). It will be remembered that Father Smith's original organ had extra pipes and divided keys for the accidentals G sharp/A flat and for D sharp/E flat -the 'sharp' being the flatter of the two in each case.
So if you want to concentrate on Baroque music you will be happiest with mean tone: if you want to play modern harpsichord music you will need equal temperament.

Although we talk about A = 440, C = 523.3 is the note to which we tune. Most traditional harpsichords based on French seventeenth- and eighteenth-century models may sound better at one of the lower baroque pitches, such as 493.9 (a semitone lower than British Standard pitch). The choice of pitch will depend on whether the instrument is to be used for ensembles or only for solo playing. For ensembles BSP is generally necessary.

When once a decision as to pitch has been made, it is unwise to make frequent changes — allow the instrument to settle down at the intended pitch.

To help the beginner we are reproducing two methods of tuning which are very similar: Godfrey Keller's rules which were included in Pierre Preller's Modern Musick-Master (London 1731) and the chart in Jean Denis's instructions from his Traité de l'accord de l'espinette (Paris 1650). J. Murray Barbour in his Tuning and Temperament, a Historical Survey classed both as equal temperament; but Keller could refer to mean tone if the fifths are flattened a little more — and notice how he works from C to an E major chord, and then takes A as a third of an F major chord and works through the flats as far as E flat. We hesitate to differ from such an authority as Barbour, but does that look like equal temperament?*

*First of all Jean Denis's table. In this we take 'juste' to mean exact, 'foible' to mean a little less than the perfect fifth, 'forte' to mean a perfect fifth and 'preuve' to mean a chord by which to test progress. As Denia's table is not very clear and his use of the baritone clef may be confusing, we have transcribed it as follows:
Denis also gives a ‘Prelude pour sender si l’Accord est bon par tout’. Again we have transcribed it so that it may be easier to read:

Keller’s rules for tuning the Harpsichord or Spinet are taken from the end of ‘The Harpsichord illustrated and improved’ which forms Part VI of The Modern Musick Master (1731). This is engraved more clearly and should not be difficult to read. If the fifths are tempered rather more than would be necessary for equal temperament, the thirds will be much improved; but it may be necessary to re-tunes the A flats for

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In tuning let your movements be smooth and gradual. If a string is a little too sharp, take it just below the note required and then pull it up. Although L shaped tuning hammers offer more leverage, there is a danger of bearing on the tuning pin; so it may be found more satisfactory to use a T shaped hammer.

When replacing a string (or when first stringing a harpsichord) hold the string tight while winding it on the wrest-pin. See that there are no kinks in the string and that it is wound evenly on to the 'pin. If the harpsichord is much below pitch, or if it is being tuned up for the first time, bring it up by stages so that wood and wire can become accustomed to the stresses.

Tuning requires infinite care in listening and great patience and accuracy. Speed will come with practice. Forkel has recorded that J. S. Bach tuned both his harpsichord and clavichord himself, and was so practiced that it never took him more than a quarter of an hour.

*Although Murray Barbour includes Denis in his chapter on equal temperament, he admits that he 'may even have had some variety of meantone temperament in mind'. One glance at Denis's Table with its major and minor semitones, good and bad thirds etc. should have convinced him that Denis was not interested in equal temperament. A facsimile of Denis's Traite de l'accord de l'espinette with an excellent introduction by Alan Curtis is published by the Da Capo Press: a facsimile of The Modern Music Master is published by Barenreiter.

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