

Disadvantages of Equal Temperament. At the same time we must not lose sight of the fact that in reality the Equal Temperament is a compromise, and a loose compromise, with fact. If it were not for the organ and piano, the imperfections of Equal Temperament would be more easily perceived; but the dynamic powers and immense

harmonic resources of these two instruments have endeared them to musicians and have concealed the roughness of their intonation. No one who has read the previous chapter and understands how to listen for beats, however, can long endure the intonation of the organ on such intervals as minor thirds. The sustained tones of that instrument bring out beats very clearly and produce a generally distressing effect for delicate ears. Of course, the truth is that most of us are so used to tempered intonation that we recognize nothing else and know of no other possibility. Yet the fact remains that whoever has heard one of the few experimental key-board instruments that have been constructed to play in pure intonation has been entranced with the sweetness of music thus played. It is far more beautiful than tempered intonation and in fact seems to impart to the music of these instruments a new sweetness and concord.

So long, of course, as the manufacture of pianos and organs is stressed rather on its industrial than on its artistic side we shall probably have to remain content with Equal Temperament. But it might as well be observed that if the piano and organ were out of the way, music throughout the

world would be on some basis of tuning other than Equal Temperament within ten years.¹

Meanwhile we must be content to tune in Equal Temperament as well as we can, knowing that when such work is well done it is very satisfactory and serves well the requirements of modern music and modern musicians.

Meantone Temperament. Before going on to consider the method of tuning in Equal Temperament, however, I should like to mention the immediate predecessor of the Equal Temperament; the famous Meantone Temperament, which flourished from the 16th to the early part of the 19th century and may be occasionally found to-day on organs in obscure European villages. This system consists in tuning a circle of fifths equally flat, in such a way as to leave all the thirds major nearly pure. In order, however, to be used for all required keys, it is necessary to have extra key-levers, for the flats and sharps of adjacent tones are not identical. For perfect performance in all tonalities, not less than 27 tones to the octave are

¹The reader who doubts this might consult Ellis (App. 20 to Helmholtz), Helmholtz, chapter 16, Perronet Thompson, "Theory and Practice of Just Intonation," and Zahm, "Sound and Music." My own book, "Theory and Practice of Pianoforte Building," contains a close analysis of the requirements of Just Intonation.