Technological changes and their effect on the development of music

Technological changes have had a great deal of impact on the development of music over the past centuries. From the development of the classical orchestra, through to the invention of electricity and recording techniques, it is clear that the creativity of scientists and engineers has been just as important as that of composers and performers in changing the face of music.

One of the most important periods of technological development in recent times is the industrial revolution, which took place in the late 18th and early 19th century, initially in Britain. The machines that were invented and the techniques that were pioneered during this period had a great deal of influence on the writing of music at the time. Firstly, Immanuel Breitkopf, a printer from Leipzig, developed a new method of typesetting that allowed music and simple songs to be published in volumes at a much lower cost than had previously been possible. This new method succeeded the old methods of engraving and commercial hand copying by publishers and it created an enormous new range of music that was available for amateur musicians.

However, more important than the development of the printing of music, was the development of the instruments themselves. One of the first instruments to undergo development was the trumpet. Originally, in the early baroque era, the natural trumpet was used, which was simply a long, often curved, metal tube, with a bell at one end, and a mouthpiece at the other. Because it did not use any keys or valves, the trumpet could only play notes from the natural harmonic sequence of the key that the trumpet was in. This severely limited the amount that the instrument could play, and meant that trumpets were generally only used to emphasise cadence points, playing the tonic and the dominant. Around the beginning of the 19th Century, the keyed trumpet was invented. Holes were inserted into the natural trumpet, which were closed using keys, meaning that the trumpet had the ability to play chromatic notes in all its registers. This, coupled with the fact that the keyed trumpet had a superior range to that of the natural trumpet, meant that it could be used much more effectively as a solo or melody instrument. A good example of music written for this instrument is Haydn's Trumpet Concerto in Eb; the piece shows of the new abilities of the trumpet by including chromatic passages, difficult ornaments, and a great range, with a top note of a high concert Db. However, the reign of the keyed trumpet was short lived, partly due to the fact that the holes in the trumpet reduced the brightness of its sound, and it has since been replaced by the valved trumpet. The valved trumpet, which uses valves to alter the length of the tubing which the air travels through in order to change the pitch of the note, has all the advantages of the keyed trumpet, and yet still retains a clear bright sound. The techniques that have been made possible by the valved trumpet has greatly changed the way that music is written and performed, particularly in the genre of jazz. A good example of a piece that displays the versatility of the modern trumpet is "So What?" recorded by Miles Davis. By under blowing, Davis creates ghost notes, which are almost inaudible percussive sounds, and by adjusting his embouchure while he plays, he is able to smudge the notes, so as to create a very vocal sound. If it were not for the development of the trumpet, than these techniques would not be possible and music written for the instrument would not have developed.

Of course, many other instruments have undergone development; the piano is one of the most notable examples. Most people, in the 18th Century played an "English" piano, although it more accurately came from Italy and Germany, which produced a powerful and sonorous sound, but one that was not as bright as that of the "Viennese" piano. Between 1800 and 1820, the English piano was extended from 5 octaves to 6 and a half. In 1835 Streicher introduced iron bars and Hoxa, a strong iron frame in 1839; both these changes meant that the piano could be more heavily strung, and thus it was able to achieve a much greater dynamic range. This had a great effect on the writing of music at the time, in that it influenced the writing of Lieder, a form of solo song, originating in Germany, and developed from the European art song. The development of the piano meant that the Lieder were not so much songs for a solo voice with a piano accompaniment, but duets between piano and voice. The improved range and dynamic contrast of the pianoforte meant that it could be used to portray feelings and emotions as effectively as the human voice.

It is not true to say that technological developments are the only influence on music. Indeed, music has been influenced by many other very wide-ranging factors. However, it is

true to say that, if it were not for the developments in technology that have facilitated developments in instruments such as the trumpet and the piano, music written for these instruments would not have changed and developed in the way that it has.