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The Iowa Piano Camera: Some Preliminary Findings

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THE IOWA PIANO CAMERA: SOME PRELIMINARY FINDINGS

LAILA SKINNER

Objective analysis of the voice and many musical instruments can be made by simply photographing the sound wave and measuring time, intensity and timbre from the records. Piano performances cannot be studied in this way because of complexities produced in the sound waves when notes are played simultaneously.

The Iowa Piano Camera, to be described in a forthcoming issue of "Science," gives an objective record of the time of incidence, time of ending, duration and a measure of relative intensity of each note played in a piano selection. There is also a record of the accompanying depression and release of the damper pedal. By means of this camera records are being made of performances by artists and these records analyzed in an effort to formulate the physical principles underlying artistic piano playing.

It is a recognized fact that the pianist does not interpret the composer's text by rigidly adhering to metronomic time nor to any one degree of intensity. Likewise there is no agreement as to the manner in which a composition should be pedaled. The artist interprets the composer's ideas and expresses his own individuality by varying time, intensity and pedaling. The same artist again varies these factors as the conditions under which he plays are changed.

We now have a means by which some of the factors in artistic piano playing may be expressed quantitatively. Among the problems concerning which information may be obtained from a study of the records are the following: temporal deviations from metronomic time, constancy of interpretation of the same composition by an artist, synchronization of notes and balance of tone in chords, means of securing emphasis and variety, differences between melody and accompaniment, phrasing and the use of the damper pedal. In this article will be given examples of the findings concerning the first two of these problems.

The pianists who have played thus far are two exceptional musicians. One is a concert artist, the other a teacher.

Pianist A was asked to play a composition of his own choosing, Chopin "Nocturne" Opus 27 No. 2, and a record was made. He

was then asked to play the same composition again and to adhere strictly to metronomic time. The records of the two performances are shown in Figure 1. (In each of the Figures presented the abscissa indicate consecutive measures and the ordinates the duration of each measure in hundredths of seconds). Two facts are obvious. First, though he does not play in strict time even when consciously attempting to do so, the deviations are much smaller. Second, the influence of the purposeful deviations in artistic rendition upon the second or attempted metronomic performance is conspicuous.

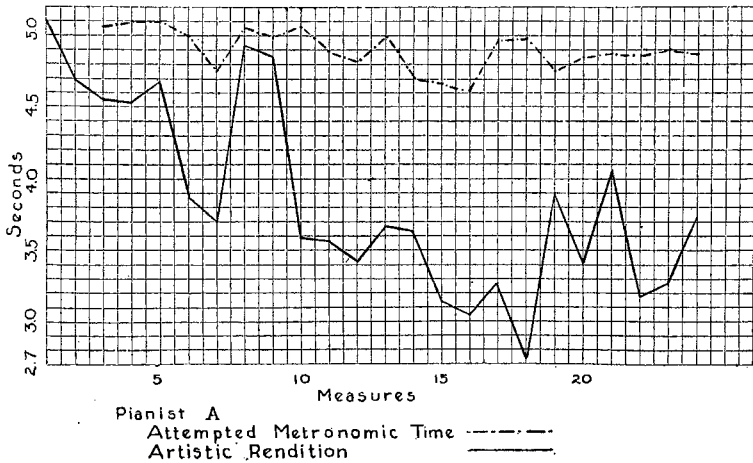


Fig. 1

Each of the two pianists has given a second performance of a composition. Figure 2 shows a record of the first twenty-four measures of the Chopin "Polonaise" Opus 40 No. 1 played by pianist A. The deviations in absolute measure length never exceed .3 sec. and the curves are practically identical in outline. The same similarities are shown in the records of Pianist B. (Figure 3) who

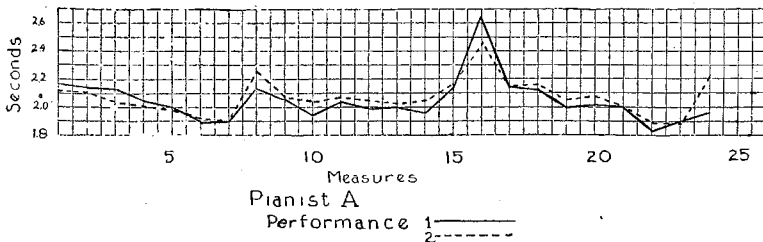


Fig. 2

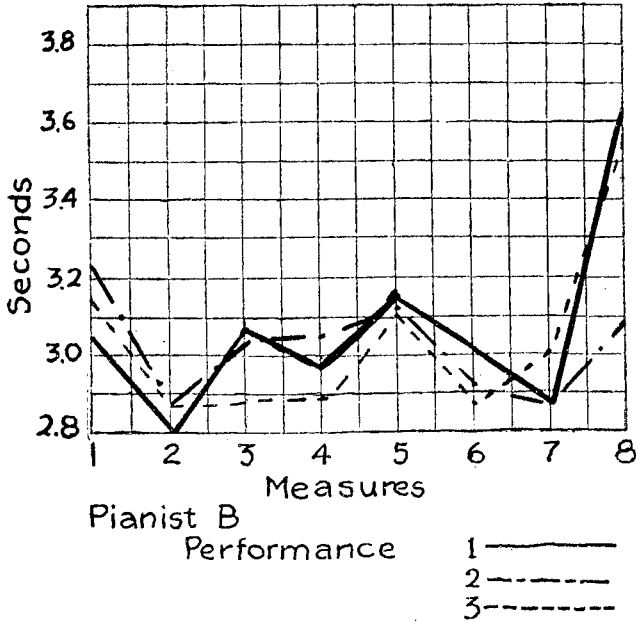


Fig. 3

played an eight measure phrase of the second movement of the Beethoven Sonata Opus 57 three different times. These records suggest that the artist has a consistent habituated interpretation of compositions which are permanently established in his repertoire.

At present we have pedal records of only the first of these compositions. In the first rendition of the "Polonaise" Pianist A used the damper pedal twenty-nine times in one section. In the second performance he omitted the pedal in two places and added it in one other. Twenty-seven of the twenty-nine pedal effects were duplicated exactly.

Figure 4 shows the records of the same composition — the

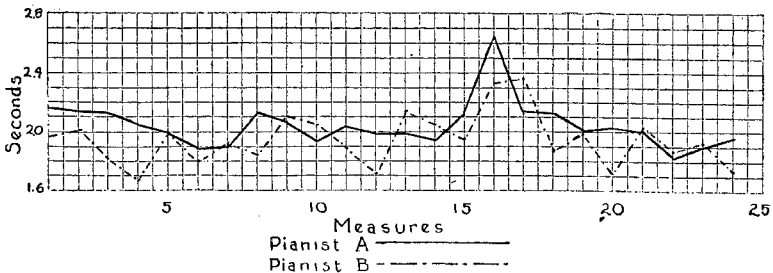


Fig. 4

Chopin "Polonaise" — played by Pianists A and B. This indicates one of the ways in which two artists may differ in their interpretation of the same composition.

The work in this study of the principles underlying artistic piano playing has just begun but these four Figures are only a few of the "Preliminary Findings" made possible by the "Iowa Piano Camera."

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