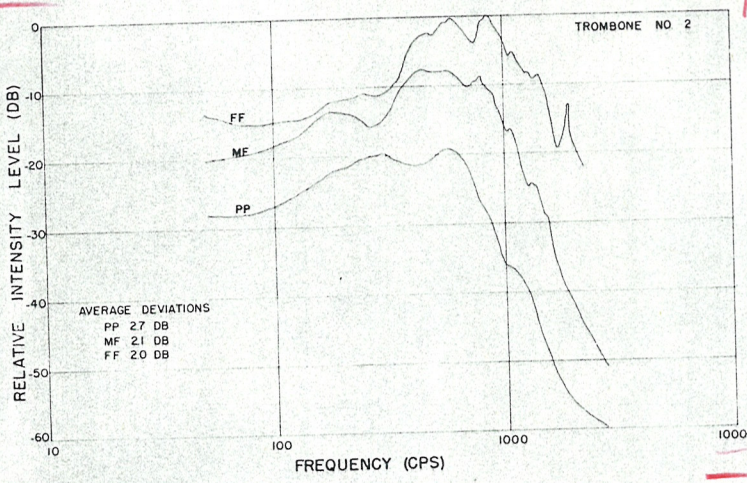

FIG. 6. Spectral envelopes of Trombone No. 2 at three dyanmic markings.

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Luce & Clark Physical Correlates of Brass-Instrument Tones

- The fractional modulations (blips) increase with the intensity of the note.
- Except for a few cases, we do not see frequency modulations during the attack transient, as was the case for the trumpet.
- The spectral envelope rolls off above 500–600 cps, as may be seen in Figs. 5 and 6. Figure 7, which displays the average rolloff above the cutoff frequency versus the intensity level of the scale, indicates that, as the intensity of the note increases, the relative amplitudes of the high-frequency partials increase, although not so markedly as in the case of the trumpet.

C. Tuba

markedly than in the case of the trumpet and trombone. Because only three points (scales) were available, the rate of change in the rolloff rate with intensity level is somewhat more uncertain for the tuba than for the trumpet or trombone.

D. French Horn

The French horn, although physically similar in some ways to the other brass instruments discussed above, differs substantially from these instruments, especially for the high notes. The following characteristics were noted:

- The attack transient displays consistently a series of rapid amplitude modulations (blips) lasting for