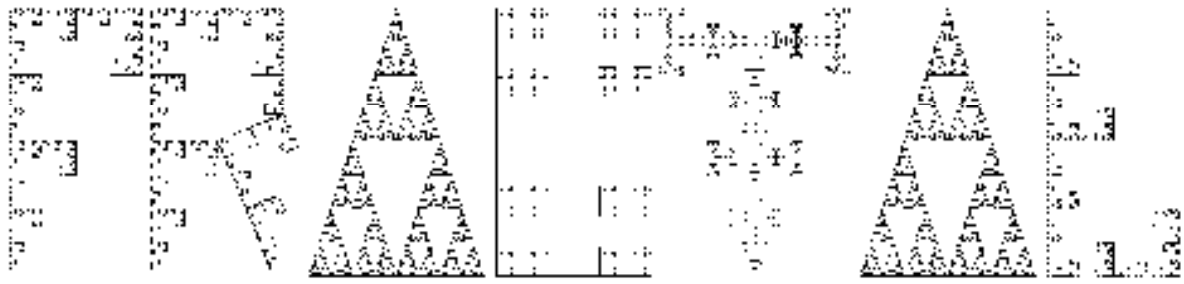


# VARIATIONS

*Fractal Variations* is based on the mathematical idea of fractals. A fractal is a shape with a very simple but interesting characteristic: if you take a small part of the fractal and magnify it, the magnified part looks just like the fractal you started with. This basic idea behind fractals is very simple, yet many fractals are startlingly complex and fascinating. One of the most famous fractals is the Mandelbrot set, a detail of which is shown on the cover of *Fractal Variations*.

One of the reasons scientists and mathematicians are so excited about fractals is that they are often found in nature. Trees, shorelines, river systems, broccoli, cauliflower, the air passages in lungs, clouds, mountains, computer networks, paint splatters, a drunk staggering around a telephone pole, and the Dow Jones Industrial Average—all show fractal patterns. Humans find many fractal patterns beautiful, and some have theorized that a preference for this sort of pattern is hard-wired into our brains.

When I first learned about fractals, I was stirred by their beauty and intricacy. As a musician, I saw that the idea would fit naturally into music, which is, after all, nothing more or less than beautifully patterned sound.

I was not really surprised, then, to find that fractal patterns are found in much music that has already been written. Sonatas of Mozart and Beethoven, string quartets of Haydn, and symphonies of Mendelssohn and Schubert are all written according to a tonal pattern that is fractal. However, all of these composers used fractal ideas naturally and unconsciously—fractals were not discovered and named until around 1980.

When I began work on this piece, I already had the theme in hand (I had written it as a sample composition assignment for a class I was teaching). I was stymied, though, trying to make this theme the basis of a larger work. As I was walking home one day, the answer came to me in a flash: use the theme as the generating shape of a musical fractal! The entire work would have the same shape as the theme, in every possible way—tonally, rhythmically, melodically, and dynamically.

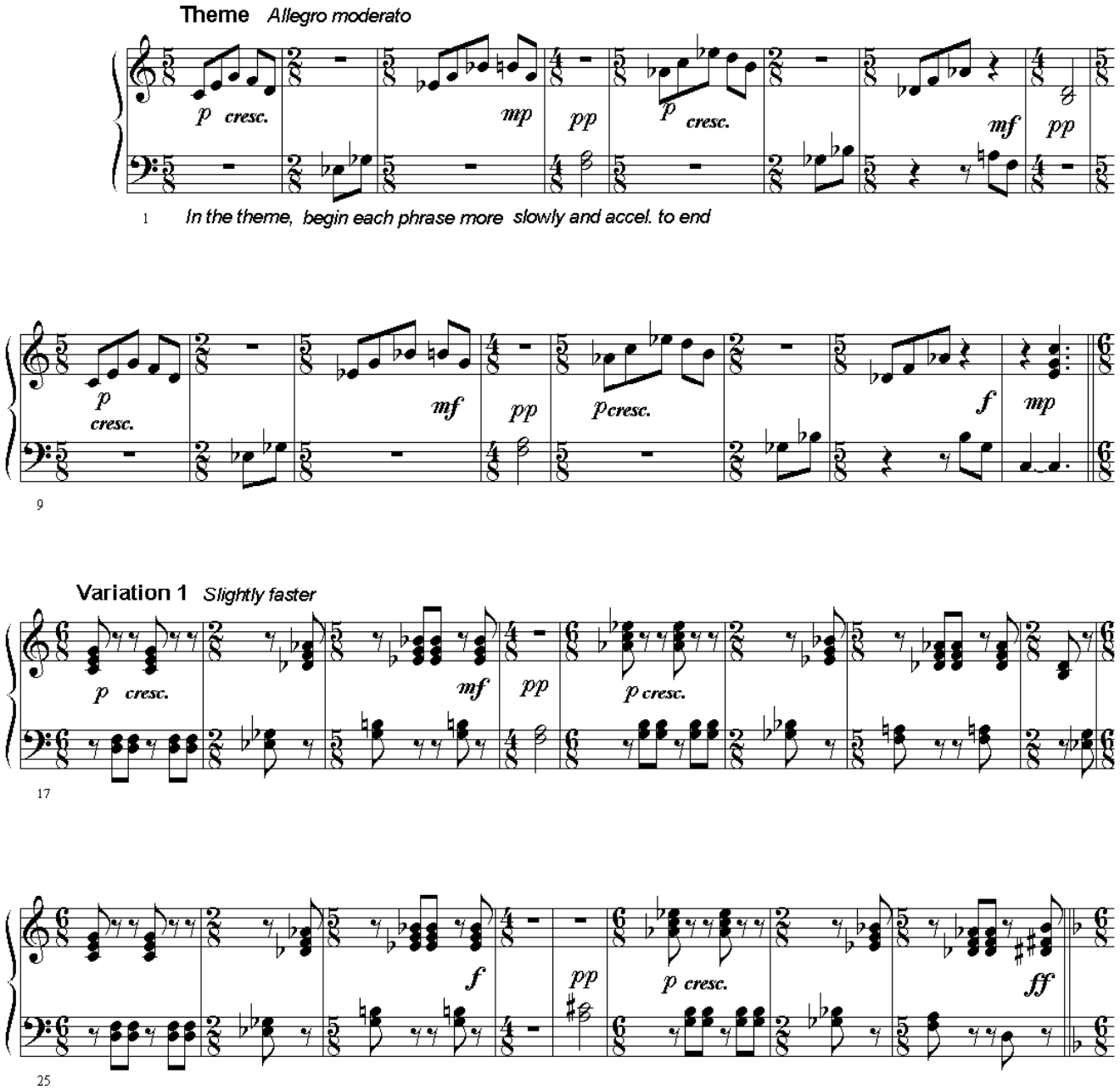
From this point, *Fractal Variations* practically wrote itself. The rough draft of the *Variations* was finished in a couple of days, literally as fast as I could write it out.

The work is difficult, technically and emotionally. My original conception of the work combined the ideas of the fractal shape and variation form with a toccata-like virtuosity and a wide range of musical expression—from the witty to the sublime to the daring and dissonant. I can only hope that in some way, the actual music you now hold in your hands measures up the power of that initial vision.

—Brent Hugh

# FRACTAL VARIATIONS

**Brent Hugh, 1991**

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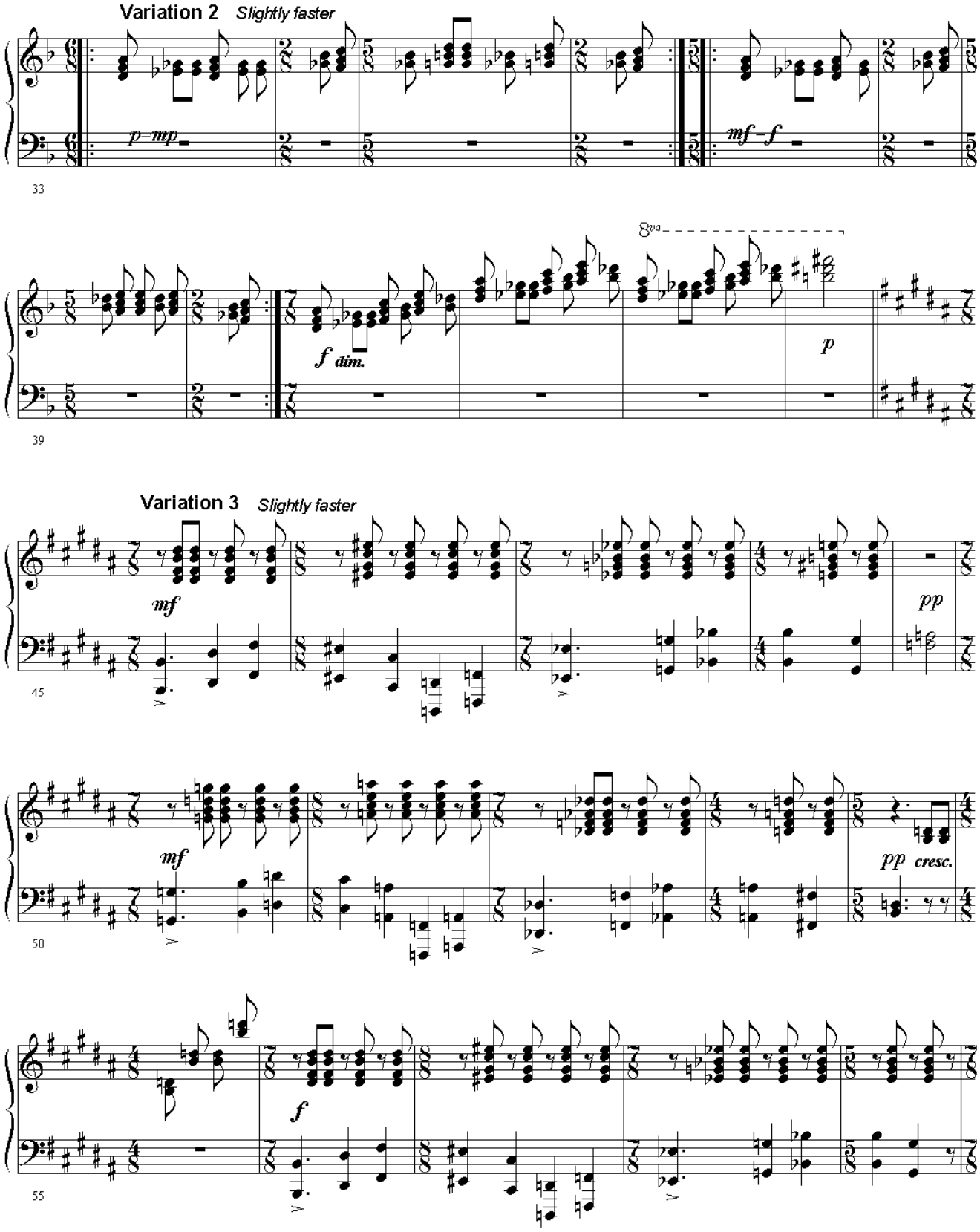
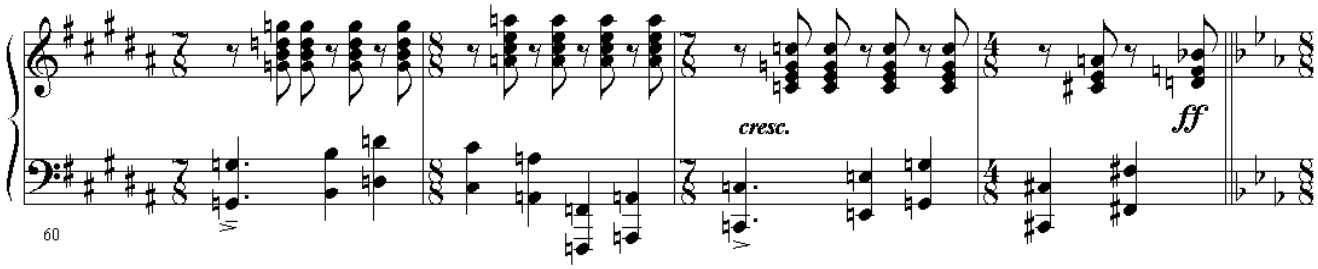
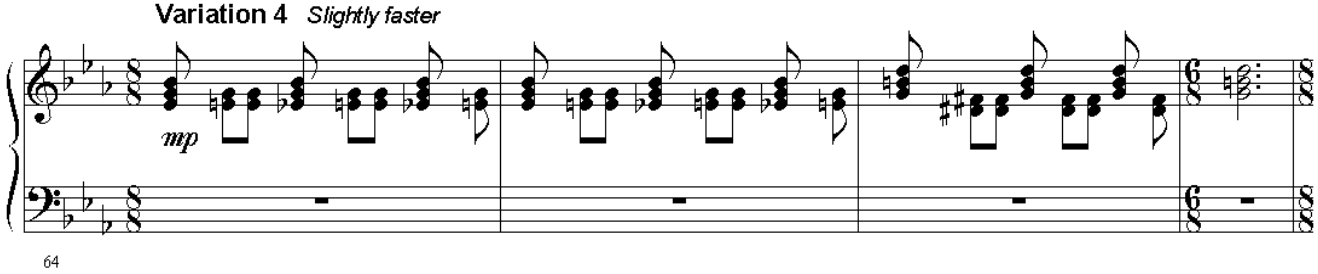
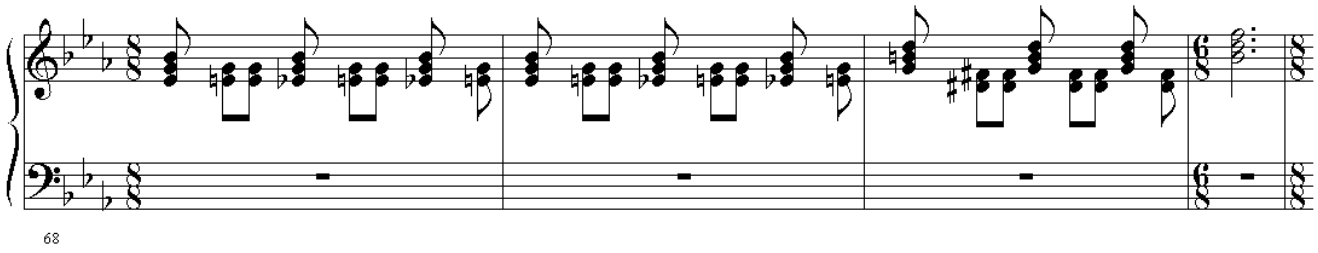

Variation 2
Slightly faster
p–mp
mf–f
33
8va
f dim.
p
39
Variation 3
Slightly faster
mf
pp
45
mf
pp cresc.
50
f
55


cresc.
ff
60


Variation 4 Slightly faster
mp
64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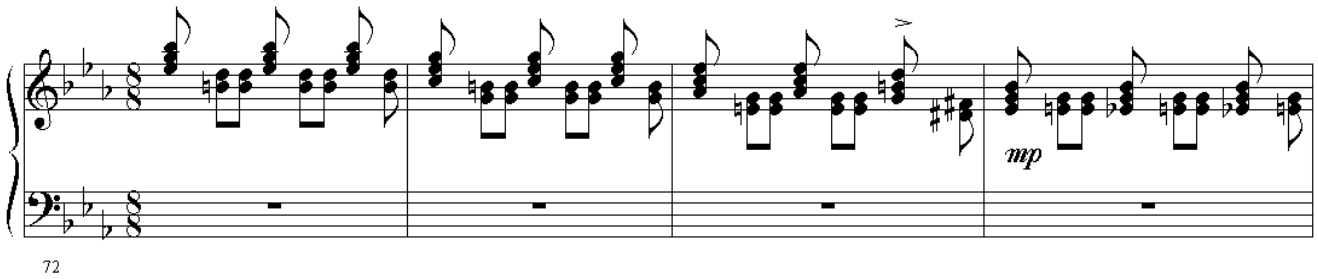
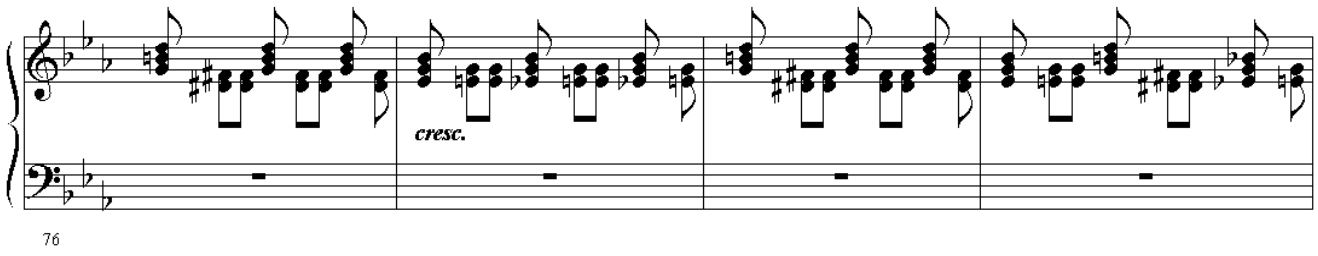
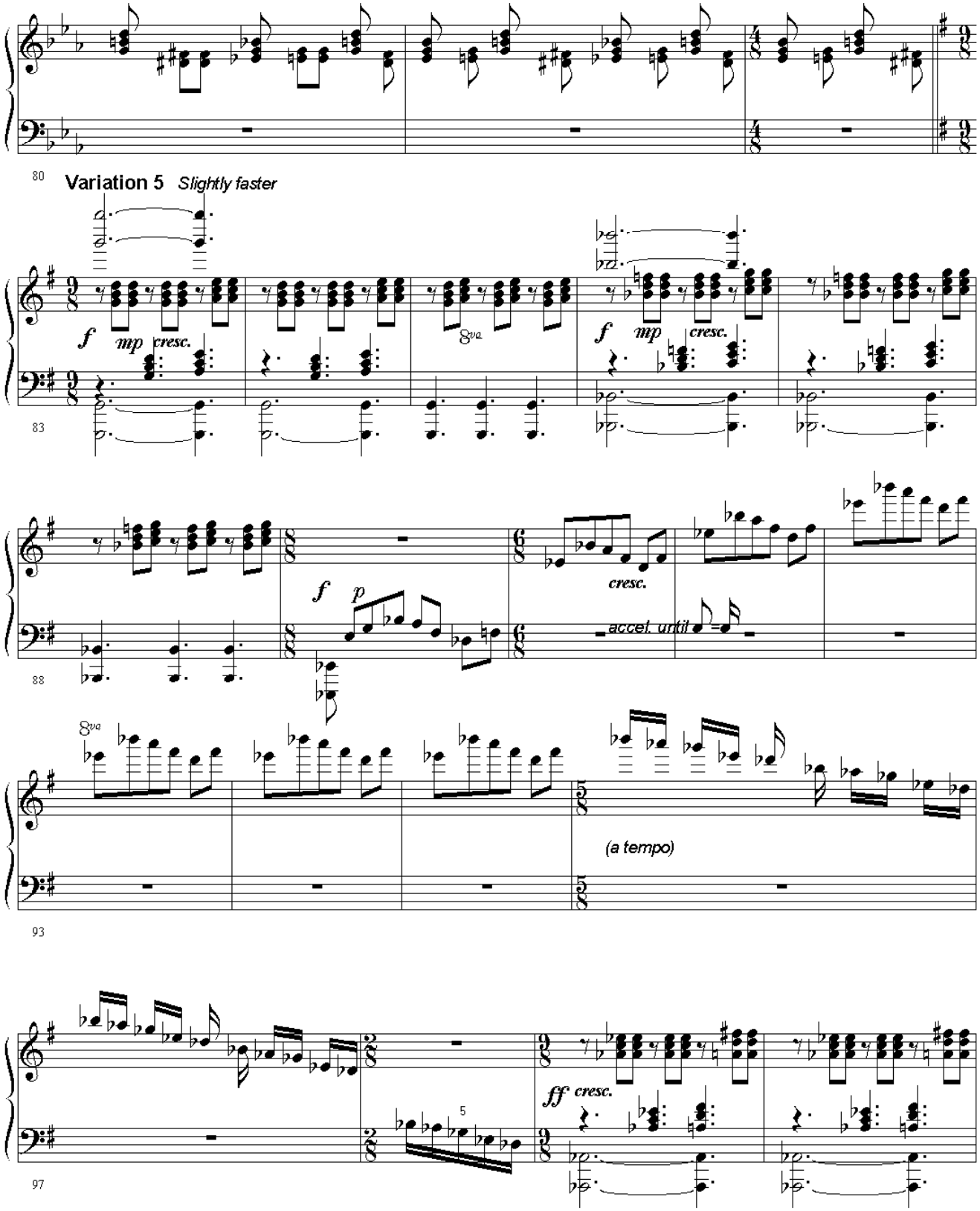
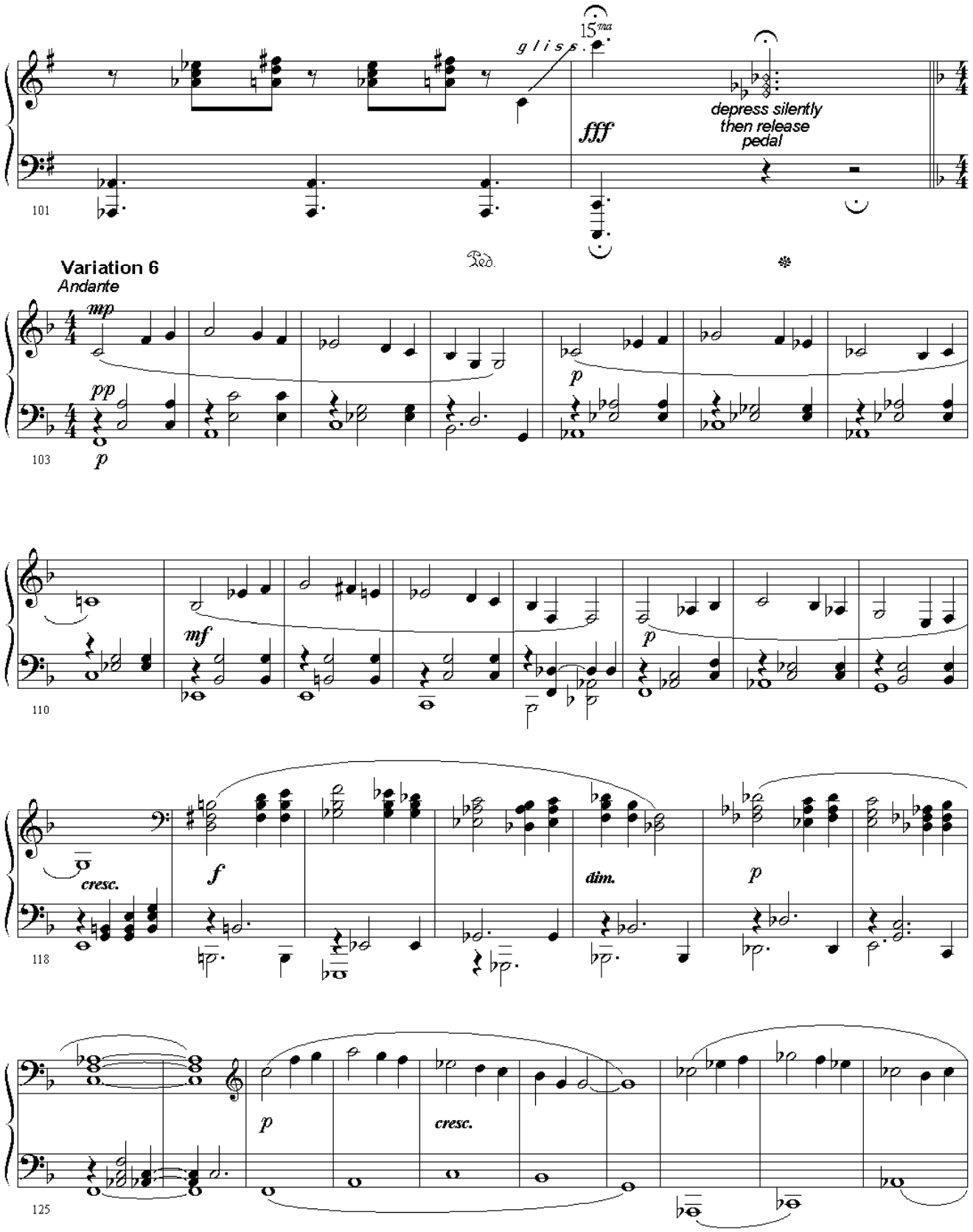
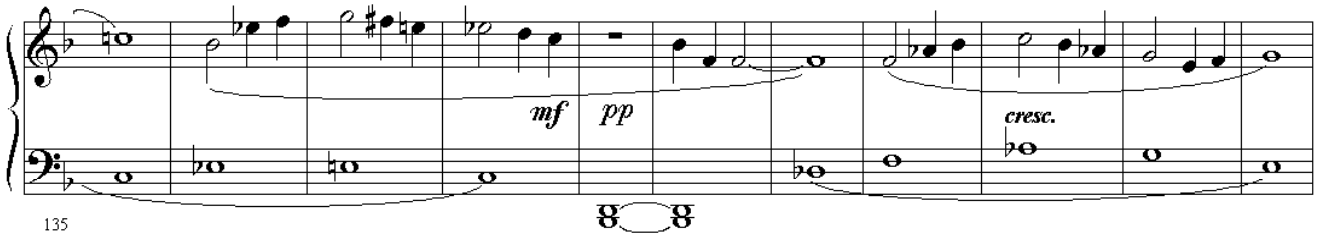
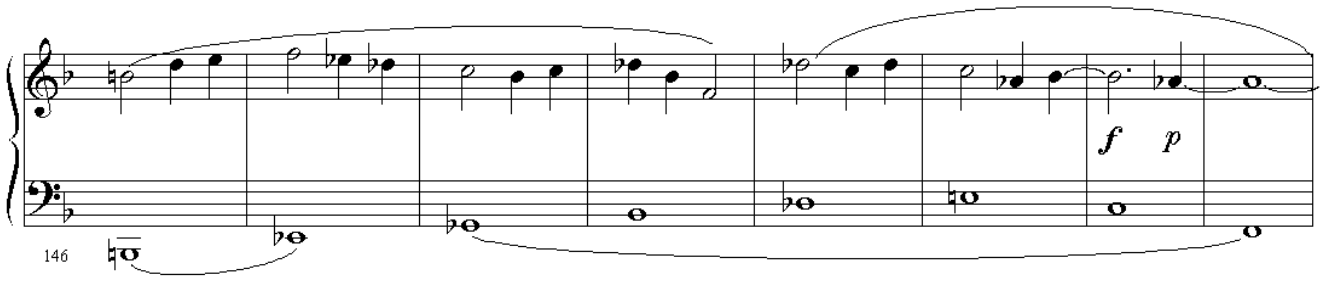

mp
72

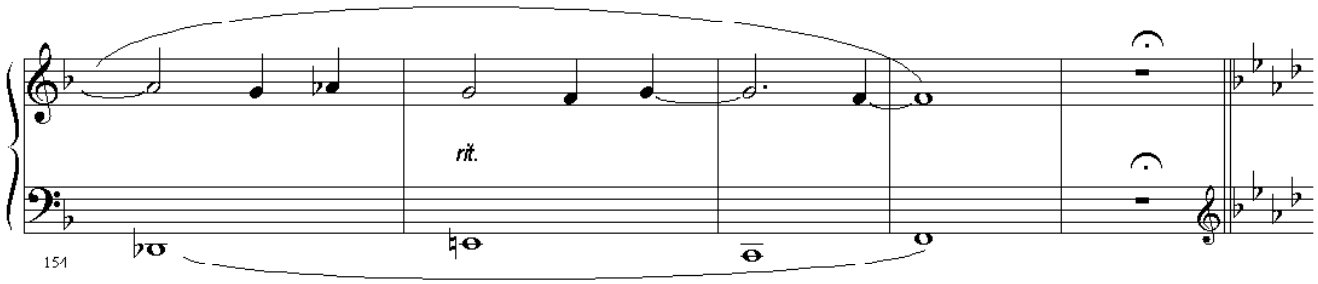

cresc.
76


80
Variation 5 Slightly faster
f mp cresc.
8va
f mp cresc.
83
f p
cresc.
accel. until
88
8va
(a tempo)
93
ff cresc.
5
97

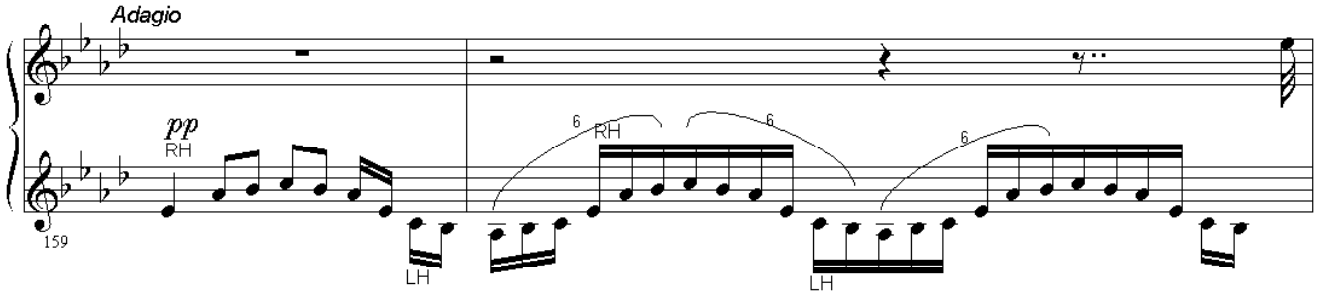

15ma
glis.
fff
depress silently
then release
pedal
101
Ped.
*
Variation 6
Andante
mp
pp
p
103
p
mf
110
cresc.
f
dim.
p
118
p
cresc.
125

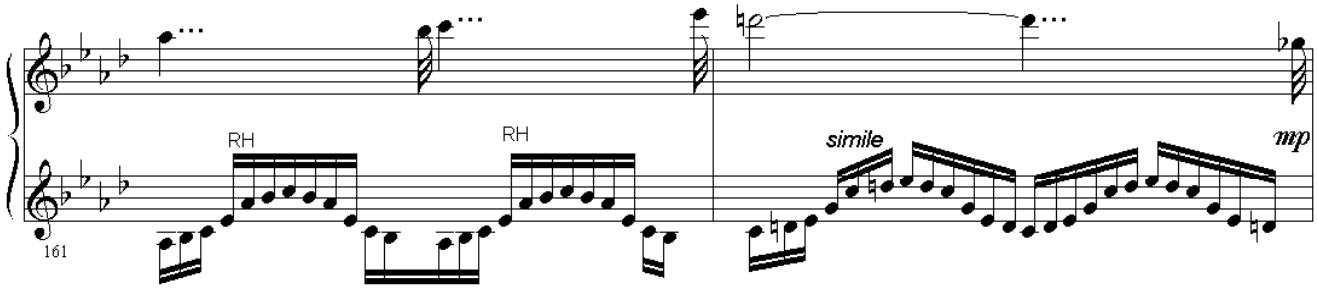

mf
pp
cresc.
135

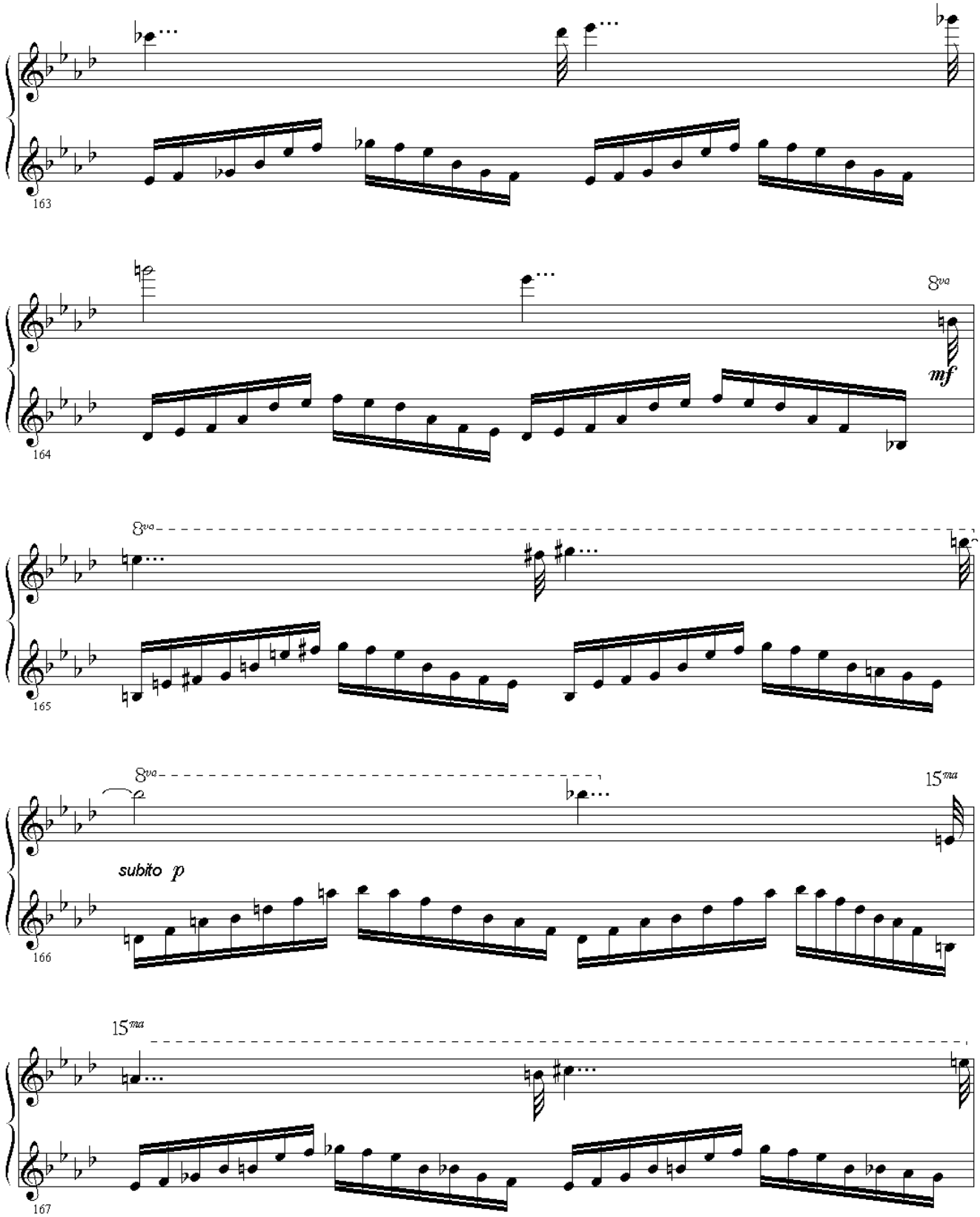

f
p
146

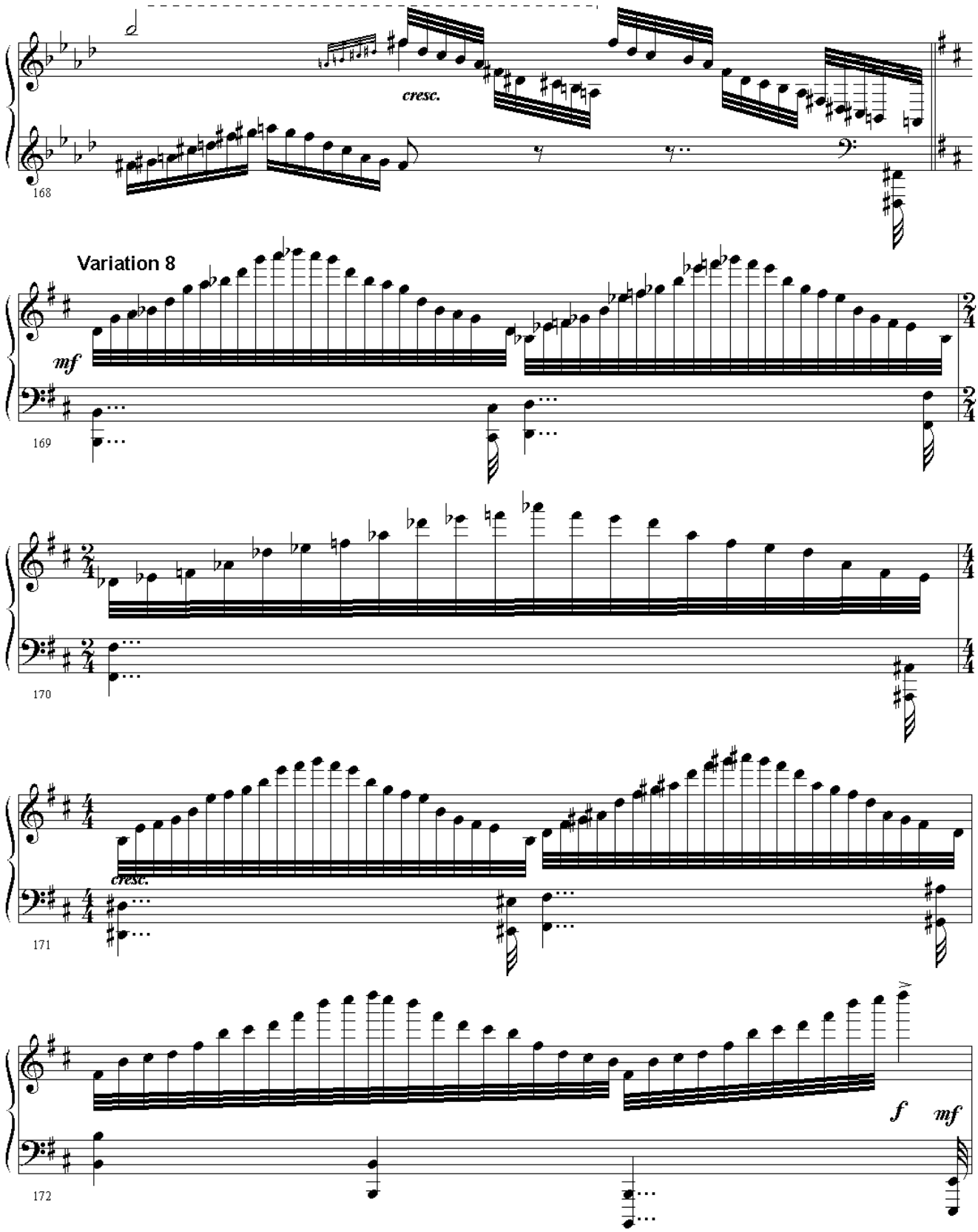

rit.
154

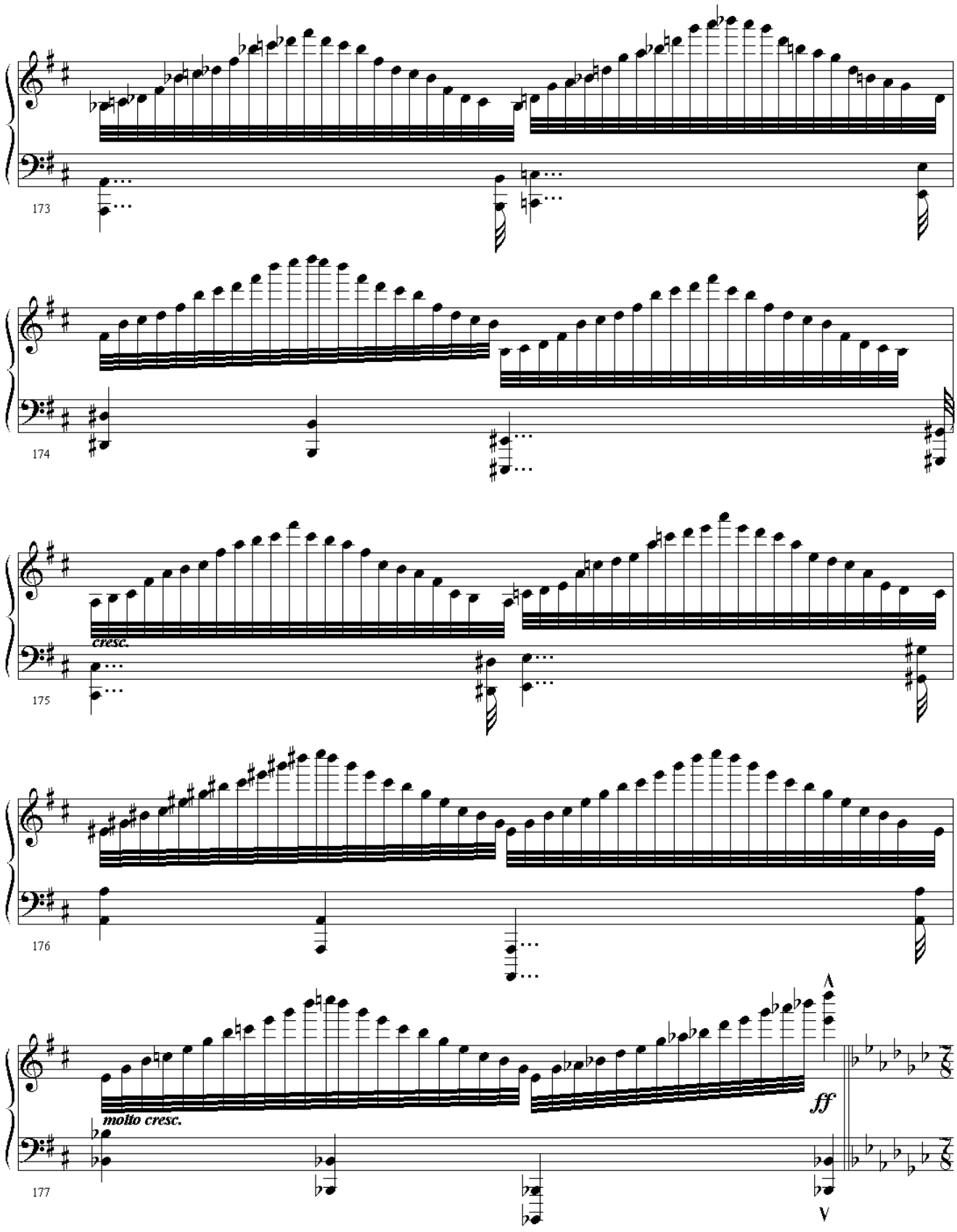
Variation 7

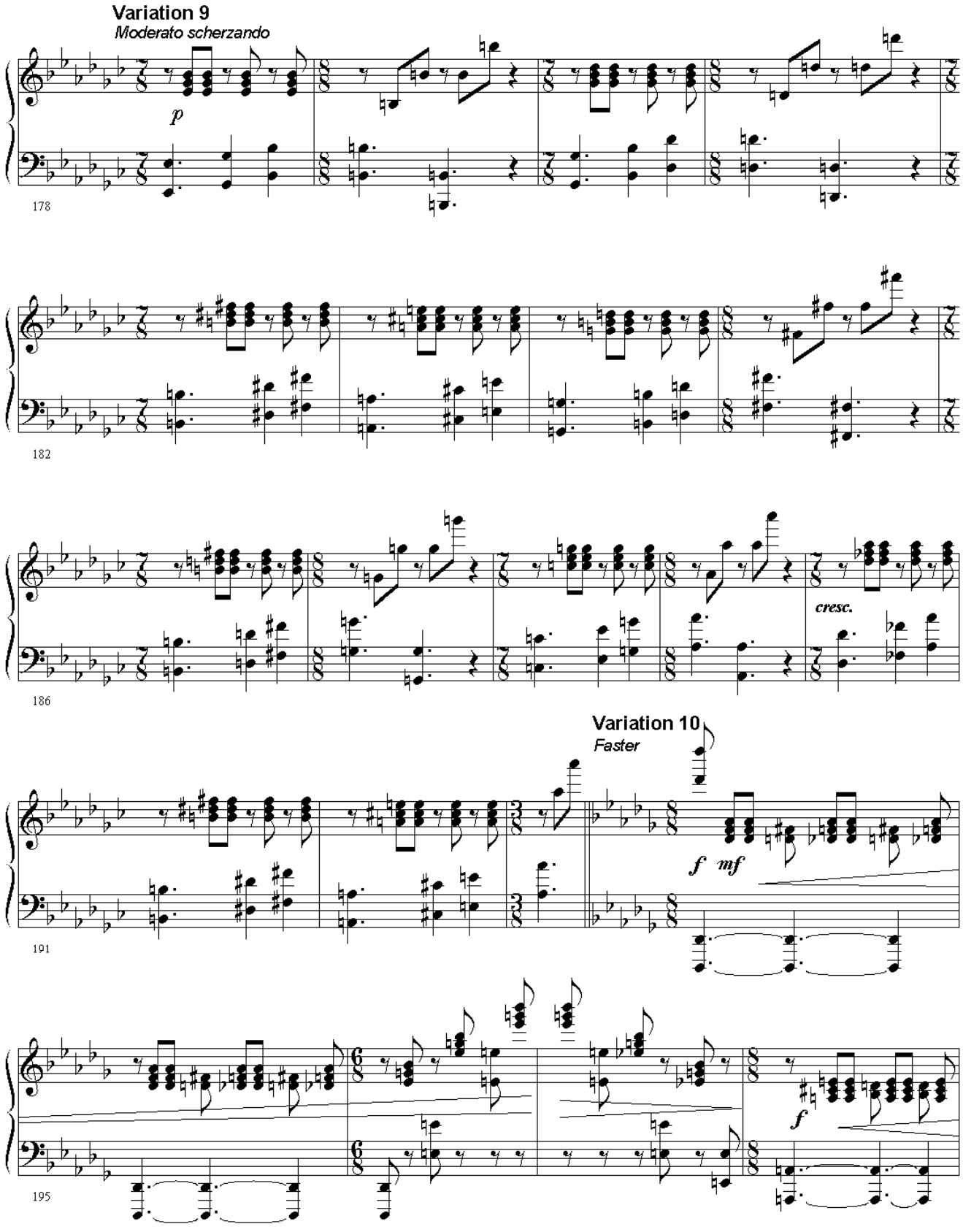

Adagio
pp
RH
6
RH
6
6
159
LH
LH

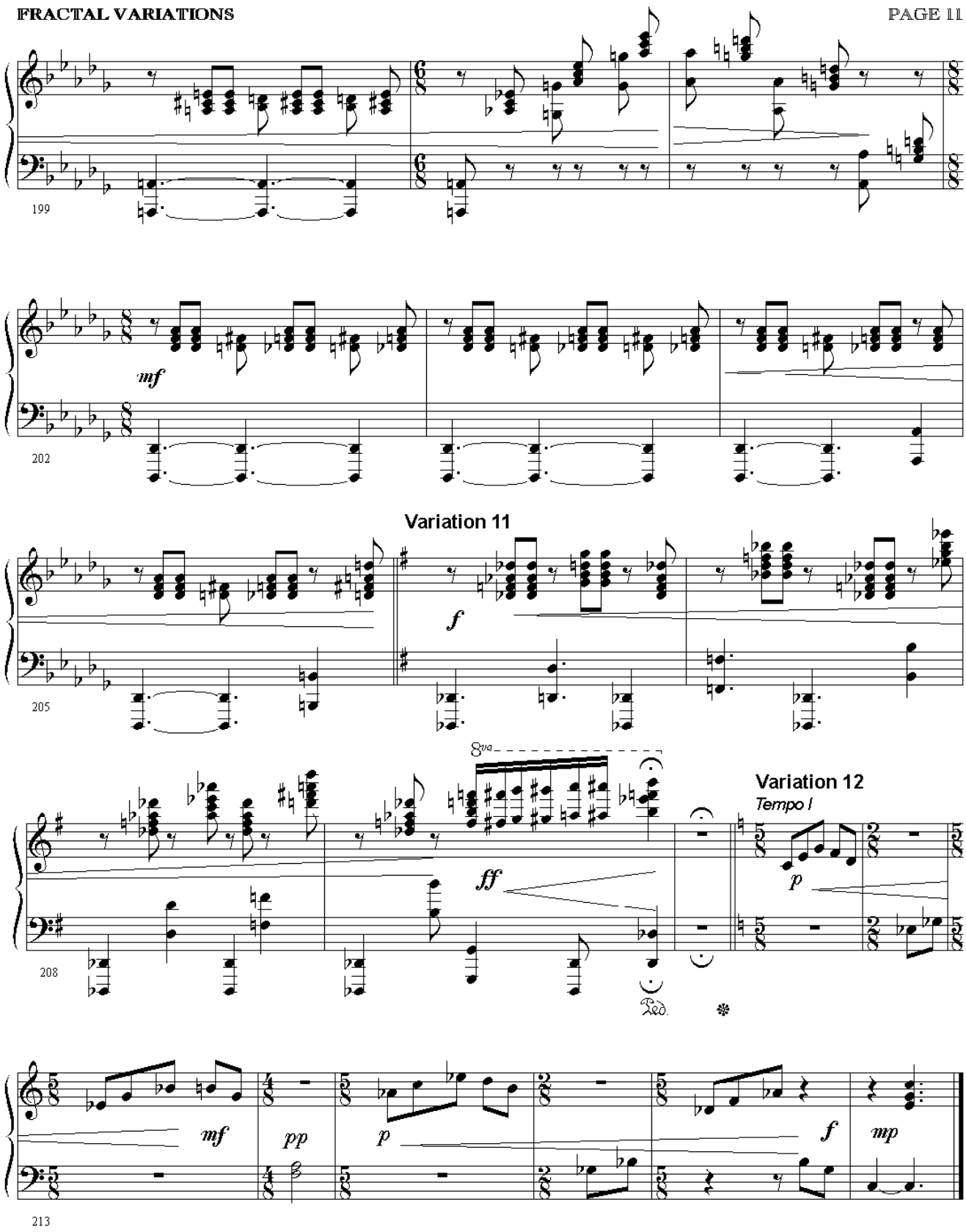

RH
RH
simile
mp
161


163
164
8va
mf
165
8va
166
8va
subito p
15ma
167
15ma


cresc.
168
Variation 8
mf
169
170
cresc.
171
f
mf
172


173
174
cresc.
175
176
molto cresc.
ff
177


Variation 9
Moderato scherzando
p
178
182
cresc.
186
Variation 10
Faster
f mf
191
f
195


199
mf
202
Variation 11
f
205
8va
ff
Variation 12
Tempo I
p
208
Ped.
mf
pp
p
f
mp
213