Chapter 35

Layers

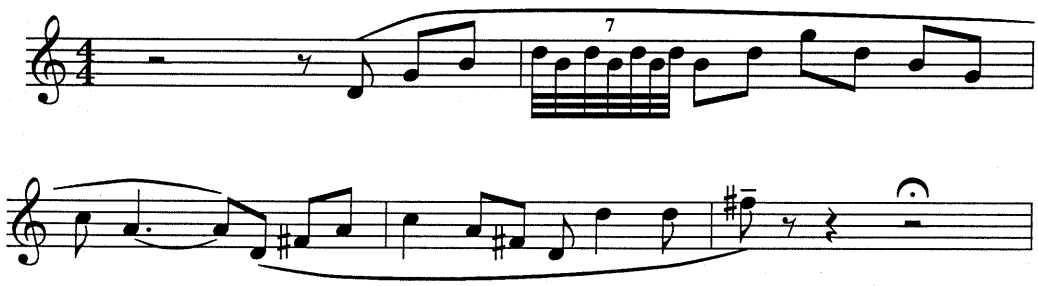
In Chapters 11 and 15 we examined different kinds of intervals, including both harmonic and melodic intervals. A number of different types of intervals were distinguished and we learned how to calculate such intervals. One type of melodic interval mentioned in Chapter 11 is the *distance interval* — an interval between pitches which are separated by intervening musical materials. In this chapter we consider more sophisticated ways of determining distance intervals. These types of intervals are the foundation of various notions of hierarchies or "layers" of pitch analysis.

This chapter also visits a related issue of implied harmony. Many melodic passages outline clear harmonic progressions which are also implicated in layer-related analyses.

Implied Harmony

Example 35.1 shows a two-phrase trumpet solo from Aaron Copland's *El Salon Mexico*. Harmonic progressions may be evident only when arpeggiated figures are collapsed. In this case, an implicit harmony may is evident where a G major chord is followed by a D dominant seventh chord. The barlines provide convenient ways of parsing the harmonies.

Example 35.1 Aaron Copland, *El Salon Mexico*.



A **kern encoding of the passage is given below:

```
!!!COM: Copland, A.
!!!OTL: El Salon Mexico
```

```
**kern
*Itromp
*clefG2
*k[]
*M4/4
=29
2r
8r
{8d
8g
8b
=30
28dd
28b
28dd
28b
28dd
28b
28dd
8b
8dd
8gg
8dd
8b
8g
=31
8cc
[4.a
8a]}
{8d
8f#
8a
=32
4cc
8a
8f#
8d
4dd
8dd
=33
8ff#}~
8r
4r
2r;
=
*-
```

We can collapse the arpeggiated chords using the **context** command:

```
context -b = -o = copland
```

Identify the chords is facilitated by using the pitch-class (**pc) representation described in Chapter 34.

```
context -b = -o = copland | pc -a | rid -d
```

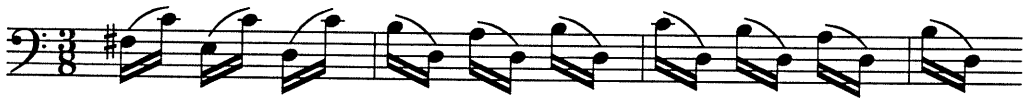
The corresponding output is:

```
!!!COM: Copland, A.
!!!OTL: El Salon Mexico
**pc
*Itromp
*clefG2
*k[]
*M4/4
r r 2 7 B
2 B 2 B 2 B 2 B 2 7 2 B 7
0 9 9 2 6 9
0 9 6 2 2 2
6 r r r
*-
```

In order to identify these as G major and D dominant chords it would be convenient to reduce the sets to (2,7,B) and (0,2,6,9) respectively. For this task, we can use a The following awk script eliminates repeated tokens within a record: (huniq: We might call this script **huniq** since it acts like a horizontal version of the **uniq** command:

```
awk '{
     # A script to eliminate repeated tokens within a record.
     if ($0 ~ /^[!*]/) {print $0; next}
     else
          { array[$1] = line = $1
          for (i=2; i<=NF; i++)
               {
               if (array[$i] == "") {array[$i]=$i; line = line
               " " $i}
               }
          print line
          for (i in array) delete array[i]
          }
     }' $1
```

Example 35.1 J.S. Bach, "Gigue" from *Suite No. 3* for solo 'cello (excerpt).



```
**kern
*M3/8
=88
(16F#
16c)
(16E
16c)
(16D
16c)
=89
(16B
16D)
(16A
16D)
(16B
16D)
=90
(16c
16D)
(16B
16D)
(16A
16D)
=91
(16B
16D)
```