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Analysis, §II: History

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Analysis, §II: History

II. History

1. Early history (to 1750).

Analysis, as a pursuit in its own right, came to be established only in the late 19th century; its emergence as an approach and method can be traced back to the 1750s. However, it existed as a scholarly tool, albeit an auxiliary one, from the Middle Ages onwards. The precursors of modern analysis can be seen within at least two branches of musical theory: the study of modal systems, and the theory of musical rhetoric. Where, in either of these branches, a theorist cited a piece of music as illustrating a point of technique or structure, only a small amount of discussion was necessary before he was using what would now be called the analytical approach.

In a sense, the classificatory work carried out by the Carolingian clergy in compiling tonaries was analytical: it involved determining the mode of every antiphon in a repertory of chant, and then subclassifying the modal groups according to their variable endings ('psalm tone differences': *see* TONARY). Such theorists as Wilhelm of Hirsau, Hermannus Contractus and Johannes Cotto in the 11th century cited antiphons with brief modal discussion, as did later theorists such as Marchetto da Padova and Gaffurius. Their discussions were essentially analysis in the service of performance. Renaissance theorists such as Pietro Aaron and Heinrich Glarean discussed the modality of polyphonic compositions by Josquin. (For examples *see* MODE, §§II, 2–4; III, 3, 4.)

Such citations of individual works were all concerned with matters of technique and substance. It was only with the development of musical rhetoric that the idea of 'form' entered musical theory. The literature of ancient classical Greek and Roman rhetoric was rediscovered with the finding of Quintilian's *Institutio oratoria* in 1416. But the application of the ideas of classical oratory has been traced back as far as the Notre Dame polyphony of the early 13th century, and its direct impact is clear in late 15th-century music. It was with Listenius (*Musica*, 1537; Eng. trans., 1975) that *musica poetica* – musical rhetoric – was introduced into musical theory. Dressler (1563) alluded to a formal organization of music that would adopt the divisions of an oration into *exordium* ('opening'), *medium* and *finis*. Pietro Pontio (1588) discussed the standards for composing motets, masses, madrigals, psalms and other genres, and similar discussions occur in Cerone (1613), Praetorius (1618), Mattheson (1739) and Scheibe (1738–40).

A plan similar to Dressler's appeared in Burmeister (1606). Burmeister had already proposed (1599, 1601) that musical 'figures' could be treated as analogous to rhetorical figures, and it was he who first set out a full formal analysis of a piece of music. It was Burmeister, too, who gave the first definition of analysis (1606, pp.71ff):

> "Analysis of a composition is the resolution of that composition into a particular mode and a particular species of counterpoint [*antiphonorum genus*], and into its affections or periods. … Analysis consists of five parts: 1. Determination of mode; 2. of species of tonality; 3. of counterpoint; 4. Consideration of quality; 5. Resolution of the composition into affections or periods."

He then discussed each of the parts of analysis in detail, and followed this by his analysis of

Lassus's five-voice motet *In me transierunt*. He defined the mode as authentic Phrygian, and discussed the total range of the piece and the individual vocal ranges. He defined the tonality as 'diatonic', the species of counterpoint as 'broken' (*fractum*), the quality as *diazeugmenorum*. Burmeister then proceeded to the fifth stage (pp.73ff):

> "Furthermore, the work can be divided up very comfortably into nine periods, of which Period 1 comprises the *Exordium*, which is elaborated with two kinds of ornament: *fuga realis* [regular imitation] and *hypallage* [imitation by contrary motion]. The seven middle periods are the *Corpus* of the work, just like the *Confirmatio* in oratory (if comparison be allowed with a kindred art). Of these, the first [Period 2] is ornamented with *hypotyposis* [word-painting], *climax* [repetition of a figure one step higher or lower] and *anadiplosis* [homophonic passages in multiple restatements at different pitches]. The second [Period 3] is ornamented in like manner, but has *anaphora* [pseudo-imitation of a figure, but not in all the voices] added to it. The third [Period 4] has *hypotyposis* and *mimesis* [homophonic phrases from different sub-choruses, answering each other at higher or lower pitches]. The fourth [Period 5] divides into two sub-choruses, and has *pathopoeia* [a semitone chromatic step expressive of sadness (on the words 'dolor meus' in Tenor I and Bassus)]. The fifth [Period 6] has *fuga realis*, the sixth [Period 7] *anadiplosis* and *noemate* [homophonic passages], the seventh [Period 8] *noemate* and *mimesis*. Period 9, the final one, is like the Epilogue in oratory. The piece ends with a principal cadence [with Tenor I falling to *E* and the Altus ascending to the octave above it]."

Passages from this motet are cited elsewhere in Burmeister's treatise to illustrate rhetorical devices, thus giving a very full exegesis of the work.

Lippius (1612) discussed rhetoric as the basis of the *forma*, or structure of a composition. Throughout the Renaissance and Baroque periods the principles of rhetoric were prescriptive: they provided routine techniques for the process of composition rather than descriptive techniques for analysis. But they played an important part in the growing awareness of formal structure during these periods, and in particular of the function of contrast and the links between contrasted sections, out of which the analytical faculty was eventually to develop. Mattheson (1739) enumerated six parts to a well-developed composition such as an aria (p.236):

> "*Exordium*, the introduction and beginning of a melody, in which its purpose and entire intention must be shown, so that the listener is prepared and his attention is aroused. …"

> "*Narratio* is a report or a narration in which the meaning and nature of the discourse is [are] suggested. It is found immediately at the entrance of the voice – or the most important concerted [instrumental] part, and is related to the Exordium … by means of a suitable association [with the musical idea found in the Exordium]."

> "*Propositio* briefly contains the meaning and purpose of the musical speech, and is simple or compound … Such propositions have their place immediately after the first phrase of melody, when actually the bass takes the lead and presents the material both briefly and simply. Then the voice begins its *propositio variata*, joins with the bass, and thus creates a compound proposition."

> "*Confirmatio* is the artistic strengthening of the proposition and is usually found in melodies by imaginative and unexpected repetitions, by which is not to be understood the normal Reprise. What we mean here are agreeable vocal

> passages repeated several times with all kinds of nice changes of decorated additions."

> "*Confutatio* is the resolution of objections [i.e. contrasted or opposing musical ideas]. In melody it may be expressed either by tied notes or by the introduction and rejection of passages which appear strange."

> "*Peroratio*, finally, is the end or conclusion of our musical oration, and must above all else be especially expressive. And this is not found just in the outcome or continuation of the melody itself, but particularly in the postlude, be it either for the bass line or for a strong accompaniment; whether or not one has heard the Ritornello before. It is customary that the aria concludes with the same material as it began; so that our Exordium also serves as a Peroratio."

Mattheson then went on to apply this sectionalization to an aria by Marcello, complete with discussion and musical examples (pp.237ff), introducing other technical terms as he did so. (*See* **RHETORIC AND MUSIC, §II**.)

So far this discussion has been occupied with principal developments up to 1750 in the analysis of structural organization. However, if a full appreciation is to be gained of the groundwork of analytical theory, then three other traditions of musical theory must be touched upon at this point: the art of embellishment, the technique of figured bass and the theory of harmony. None of these is itself centred on analysis, but each bears on it.

The tradition of embellishment manuals, stretching from Ganassi (*Fontegara*, 1535) to Virgiliano (*Il dolcimelo*, *c*1600) and then on to the 17th-century vocal and instrumental tutors, was primarily concerned with teaching graces and *passaggi* to performers. This was done by means of tables of ornaments, extended practical examples and formulated rules. In these manuals is established the fundamental concept of ‘diminution’. This concept has two aspects: (1) the subdivision of a few long note values into many shorter values; and (2) the application to an ‘essential’ melodic line of a layer of less essential linear material. In both aspects a hierarchy is created, and in both the possibility exists of the hierarchy becoming multi-layered as an already embellished line is subjected to further embellishment. On the face of it this was a quest for the purely transient affair of the virtuoso performer. In reality much 16th-century music contained elements of embellishment as it was written down; and the modern style of 17th-century *seconda pratica* subsumed ornamentation within its notated exterior. The compositional notion of inventing (or adopting) a basic structure and then elaborating it, which goes back at least to the 9th century and was developed as *contrapunctus diminutus* by 14th-century theorists, was crystallized in this instructional tradition and was absorbed deep into European musical consciousness. Nowhere was this truer than in the *stile antico* lineage, which led from Diruta (*Il primo libro*, 1580) through Berardi (*Ragionamenti musicali*, 1681; *Miscellanea musicale*, 1689) and Fux (*Gradus ad Parnassum*, 1725) right into the heart of the 19th century. It should not be forgotten that Beethoven was steeped in this tradition and to the end of his life remained profoundly influenced by his lessons from Albrechtsberger. This tradition was to be of incalculable importance to the theories of Heinrich Schenker at the beginning of the 20th century.

The teaching of figured bass was similarly performer-orientated. The line of treatises stretched from Agazzari (*Del sonare sopra’l basso*, 1607) into the 18th century. It tended to foster the concept on which it was founded: that of the chord as an indivisible unit. It evolved a new categorization of consonance and dissonance which, like the concept of diminution, was absorbed profoundly into the mainstream of musical thought. However, it masked the concept of ‘root’ by concentrating on the actual bass line.

Unquestionably the most influential music theorist of the 18th century was Rameau. Rameau was not himself concerned with analysis of form and large-scale structure. His theory of harmony nonetheless had latent significance for future analysts. Rameau ‘conceptualized those principles of tonality which were so thoroughly revolutionizing harmony in the early eighteenth century’ (Gossett, ed. and trans.: Rameau: *Traité*, 1971, p.xxi). He asserted the primacy of harmony over melody. At the heart of his theory are the three ‘primary consonances’, the octave, 5th and major 3rd, and the

fact that they are contained within and generated by the single note. (This he saw first through mathematical subdivision of string lengths, as had Zarlino before him, and later through the observed overtone structure of a sounding body, or *corps sonore*.) He saw the octave as the 'replica' (*réplique*) of its source (ibid., 8). From these observations he posited the notion of transposing the natural order of sounds in a harmony, thus isolating the principle of 'inversion' (*renversement*): 'inversion is basic to all the diversity possible in harmony' (ibid., 13). The principle of 'implication' (*sous-entendre*) allows that sounds may be heard in a chord while not existing in their own right. Inversion, replication and implication together yield the notion of 'root' (a concept which had already been grasped by Lippius, 1612, and Baryphonus, *Pleiades musicae*, 1615, 2/1630) and thus also the series of such roots, some present and some implied, that underlies a harmonic progression containing inverted chords. This series of notes Rameau termed 'fundamental bass' (*basse fondamentale*).

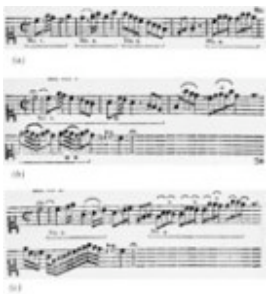
What did this theory have to offer to analysis? First, it offered explanations for chordal structures, consonant and dissonant, thereby providing tools for chordal analysis. Second, it presented a highly centralized view of tonality, comprising a very few elements which could occur in a rich variety of ways. Together with the rules for the operation of 'fundamental bass', this paved the way for a reductionist approach to musical structure. Finally, by giving acoustical primacy to the major triad it offered the prospect of scientific verifiability to analytical systems.

Rameau's exact contemporary J.D. Heinichen was almost as prophetic in certain respects. His *Der General-Bass in der Composition* (1728) was written towards the end of the figured-bass tradition and brought that tradition into contact with the theory of composition. Heinichen came close to formulating a theory of chord-progression. Of particular interest to the analyst is his notion of 'fundamental roles' (*Fundamentalnoten*), by which he denoted the principal notes in a melody line after inessential notes have been stripped away.

2. 1750–1840.

The origins of musical analysis as one now thinks of it lie in early 18th-century philosophy and are linked with the origins of the aesthetic attitude itself. For it was in the 18th century, and particularly with the English philosophers and essayists, that the idea came to the surface of contemplating beauty without self-interest – that is, without motive of personal improvement or utility. This new attitude was termed, by one of its earliest protagonists, Lord Shaftesbury (1671–1713), 'disinterested attention'. It embodied a mode of interest that went no further than the object being contemplated, and was engrossed in the contemplation itself. Leibniz, at about the same time, evolved a concept of perception as an activity in itself rather than as a processing of sense-impressions. This active concept of perception was important in the work of Alexander Baumgarten (1714–62), who coined the word 'aesthetics'. It was during this period that the notion of 'fine art' as such, divorced from context and social function, arose.

In Shaftesbury's equation of disinterested attention with 'love of truth, proportion, order and symmetry in things without' lies the germ of formal theory as it was developed in Germany during the second half of the 18th century. His declaration that '*the Beautiful*, *the Fair*, *the Comely*, were never in the *Matter*, but in the *Art* and *Design*; never in the *Body* itself, but in the *Form* or *forming Power*' (*Characteristicks of Men, Manners, Opinions, Times*, 1711, ii, 405) drew attention to the outward form as the object of contemplation rather than content. Such an attitude came through in, for example, *Der allezeit fertige Polonoisen- und Menuettencomponist* (1757) by J.P. Kirnberger, one of a number of publications that laid down a fixed chord scheme for dances, and supplied several motifs for each bar from which one was to be selected by throwing a dice.



From J. Riepel: 'Anfangsgründe zur musikalischen Setzkunst', iv

However, it was not in the field of analysis or of criticism, as one might expect, that these perceptually based ideas were fully articulated in music for the first time. It was in composition teaching: in particular in the writings of the theorist H.C. Koch. The most significant aspects of Koch's important work *Versuch einer Anleitung zur Composition* (1782–93) were the twin subjects of phrase structure and formal model. Koch's principle of phrase extension had its forerunner in the *Anfangsgründe zur musicalischen Setzkunst* (1752–68) of Joseph Riepel. In his second chapter (Frankfurt, 1755) Riepel discussed the construction of eight-bar phrases in two four-bar units, designating each according to its type of cadence as *Grundabsatz,*

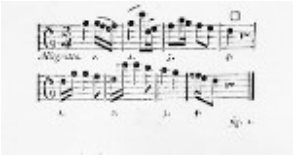
(Augsburg, 1765),... *Aenderungsabsatz* or *Aenderungscadenz* (pp.36ff). He went on (pp.54ff) to discuss repetition and phrase extension (*Ausdähnung*) and interpolation (*Einschiebsel*). Riepel used graphic signs – the square, crosses and letters – to designate constructional devices. In his fourth chapter (Augsburg, 1765) Riepel considered melodic 'figures' (*Figuren*) not in the rhetorical Baroque sense but as units of formal construction. He presented the first five bars of an aria, marking the four musical figures by brackets and numbers (**fig.1*a***). He then took no.1 and showed how it might be repeated sequentially at the interval of a 3rd (marking the repetition with a double cross; **fig.1*b***), then at the 2nd and the 5th. He then worked a sequential extension of no.2 which continued with no.4 (**fig.1*c***), and so on (pp.81ff). The examples were still very much in the style of Baroque melodic construction, but Koch described Riepel's work as 'the first ray of light' (ii, 11).

There is evidence that Kirnberger too was influenced by Riepel in his writings. In *Die Kunst des reinen Satzes in der Musik* (ii/1, 1776), he employed a range of teminology for melodic structures that provides a halfway-point between Riepel and Koch. Each large-scale section of a piece, called *Haupttheil*, was subdivided into several units, each called *Periode* or *Abschnitt*. They were themselves subdivided into several units, each known as *Satz* or *Rhythmus*. They in turn were subdivided into the smallest unit of all, each known as *Cäsur* or *Slied*. The term *Einschnitt* equated sometimes with *Satz*, sometimes with *Cäsur*. Kirnberger offered rules (ii/1, 140–51; also briefly i, 1771, p.96; Eng. trans., 407–16, 114) on the construction of all these units, especially as to their length, rhythmic patterning and cadence-forms. In stating that the number of bars constituting a *Satz* should normally be a multiple of four, or at least of two, he made special allowance for interpolation. A one-bar unit, a repetition of the previous bar, could be inserted (ii/2, 143; Eng. trans., 409) without disturbing the feel of the unit. Moreover, the *Satz* could be extended by the elongation of the value of one or more of its main notes. This might result in five-, seven- or nine-bar *Sätze*. Fig.3 [not available online] shows his graphing of a succession of three five-bar units by bar number and slur marks.

Kirnberger had apparently been a pupil of J.S. Bach, and certainly sought to disseminate Bach's methods; in turn he was the musical adviser to the great Swiss aesthetician J.G. Sulzer. He was also the direct heir of the two lines of harmonic theory that descended from Rameau and Heinichen. This may be seen in three harmonic analyses of pieces (two of them entire) that are associated with him. The first is an analysis of his own E minor fugue, which he appended to vol.i (1771) of *Die Kunst des reinen Satzes in der Musik* in order to demonstrate how to 'detect the true harmony as conceived by the composer', distinguishing it from passing notes, in complex situations. 'Once beginners have acquired skill in the accurate analysis of harmony in this piece, we recommend to all of them that they also study the works of great masters in a similarly thorough way' (Eng. trans., 266, 270ff). This analysis is laid out on five staves, the top two presenting the fugue entire. The fifth staff shows the fundamental bass as Kirnberger derived it, the fourth shows the inessential dissonances, and the third presents a figured bass for the composition, so as to show the inversions of chords. *Die wahren Grundsätze zum Gebrauch der Harmonie* (1773), published over Kirnberger's name, was probably written by his pupil J.A.P. Schulz under his supervision. Appended to this work are harmonic analyses of two works from Bach's *Das wohltemperirte Clavier*: the Fugue in B minor from book 1 (selected because of its apparent insolubility) and the first part of the Prelude in A minor from book 2. The latter is rather simpler, but the B minor Fugue is laid out on two pairs of staves (the top pair presenting the fugue in finished form), with two further individual staves below. The third and fourth staves give a figured bass (using the bass of the fugue where appropriate) with chords over it that simplify by removing all inessential dissonances. The fifth staff gives the fundamental bass, with figures that retain the essential dissonances. Finally, the sixth staff gives the fundamental bass with only the fundamental chords recorded in its figuring – that is only triads and chords of the 7th, in accordance with Rameau's principles.

Koch's exposition of melodic phrase structure in the 1780s and 90s was to be of the profoundest importance for music theory, ultimately also for analysis, and it led directly to Riemann's theory of dynamic and agogic. The exposition is in Part ii of the *Versuch* (section 2, subsection 3 'On the construction of melodic sections', and subsection 4 'On the combining of melodic sections, or the construction of periods'), occupying in all some 500 pages. It follows immediately on a discussion of rhythm and metre, and establishes a hierarchical framework in which two-bar 'segments' or 'incises' (*vollkommene Einschnitte*) combine in pairs to form four-bar 'phrases' (*Sätze*) which in turn combine to make 'periods' (*Perioden*). Koch then laid down rules as to how this framework might be modified without loss of balance. Chapter 3 of subsection 4 contains three studies 'Of the use of melodic extension'. The first is of extension by repetition of all or part of a phrase; here Koch conveyed the idea of function within a phrase rather than melodic material, speaking often of 'the

repetition of a bar' when the content of that bar is different on second statement. The second study is multiplication of phrases and cadential figures. The third is of the highly significant concept whereby a two-bar or four-bar phrase-unit may be embedded within an existing melody. Koch explained with each extension device (*Verlängerungsmittel*) how it could be used without upsetting the general effect of symmetry. Thus for example he stated that 'When a phrase contains one-bar units of which the first is repeated, then the second must also be repeated', because if not 'the unequal handling of these small units stands out as an unpleasant effect' (ii, 63ff).



From H.C. Koch: 'Versuch einer Anleitung zur Composition', ii (Leipzig,…

Chapter 3 of subsection 3 describes processes of melodic compression effected by the telescoping of two phrase-units to form a single unit. In this chapter he used a bar-numbering system that shows the bar at the point of telescoping as having two functions. Fig.2 shows the telescoping of two four-bar phrases into a seven-bar period, with the suppressed bar (*Tacterstickung*) marked with a square (ii, 455).

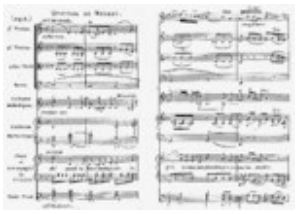
Koch's processes of extension and compression show his concern with symmetry and proportion on the smaller scale. Subsection 4 also presents the construction of compositions in ascending order of magnitude, from 'the combining of melodic sections into periods of the smallest size, or the organization of small compositions' (chap.2, iii, 39–152) involving the combination of four melodic sections 'of which two have a cadence in the home key' (p.57), 'of which one has a cadence in a related key' (p.81), and 'in which only a single closing phrase occurs' (p.111), and the combination of 'more than four sections in small compositions' (p.128) to 'the combination of melodic sections into periods of greater length, or the organization of larger compositions' (chap.4, iii, 231–430). In this way Koch drew all the musical elements of a composition into mutual relationship – for music is 'that art which expresses feelings through the relationships between notes' (i, 4).

It is in these two chapters that the other important aspect of Koch's work comes to the fore: that of the formal model. In this respect he cited as his authority Sulzer's *Allgemeine Theorie der schönen Künste* (1771–4), in which the idea of 'layout' (*Anlage*) or model is put forward. Such a model sets down a plan for a work and the most salient features. The artist, following this model, is then to proceed to the 'execution' (*Ausführung*) or completion of design and finally to the 'elaboration' (*Ausarbeitung*) of the work in all its details. Accordingly, within the discussion of smaller forms (iii, 39ff) Koch provided the plan and characteristic details of the gavotte, bourrée, polonaise, anglaise, minuet and march, concluding with the chorale and figured melody. He described, for example, the gavotte as 'a dance piece of lively and pleasant character' much used in theatrical dance. Its features are '(1) an even time signature which is usually in 2/2 and not too fast; (2) that each phrase begins with a two-crotchet upbeat; (3) that it has even-numbered rhythmic units with a detectable phrase division at each second bar; (4) that it comprises two sections, each of eight bars'.

All these models were offered as generative: from them compositions could be created, almost mechanically – 'almost', because Koch held the view that 'living expression' (*lebendiger Ausdruck*) was essential to the artist ('the poet who abandons expression, image, figure, and becomes a dictionary-user, is in error', i, 6). They form part of an instruction manual that proceeds from harmony to counterpoint and then to melody and form. Yet they are important, too, in the history of analysis, because they separate 'norm' from individuality, implicitly stating what was 'expected' and thereby defining liberty. Moreover, although most of Koch's abundant music examples were specially written for the book (in the contemporary style of Graun, Benda, and early Haydn and Mozart), he appended to his discussion of the combination of four melodic sections a brief analysis (iii, 58ff) of the minuet from Haydn's Divertimento in G (HII:1). The criteria for his analysis are particularly interesting: 'This little minuet', he began, 'has the most complete unity'. He followed the philosophical dictate, transmitted by Sulzer (under *Einheit*), that 'wholeness … and beauty consist of diversity bound together in unity'. Sulzer described unity with reference to a clock: 'if only one of its mechanical parts is removed then it is no longer whole [*Ganzes*] but only a part of something else'. In his analysis Koch identified the first four bars as the 'sole principal idea', repeated to form a closing phrase. The opening of the second half, also repeated as a closing phrase, 'while different from the preceding sections, is actually no less than the self-same phrase used in another way; for it is stated in contrary motion, and by means of a thorough deviation which results from this becomes bound together through greater diversity'.

Not only is the 'model' an important tool for formal analysis, later to be used by Prout, Riemann and Leichtentritt, but also the Sulzerian process of model–execution–elaboration is itself an important concept of artistic creation, which later acquired its analytical counterpart in the theory of

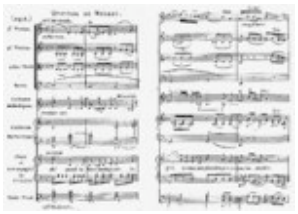
layers (*Schichten*). In addition, Koch equipped the composer and analyst with a terminology, derived from grammar and rhetoric, for the description of structure. For him, melody was 'speech in sound' (*Tonrede*), comprising grammar and punctuation. He sought to establish a 'natural law' of musical utterance (*Tonsprache*) which he called the 'logic of the phrase'. In this logic the smallest sense-unit, called 'incomplete segment' (*unvollkommener Einschnitt*), normally occupied one bar, the 'complete segment' (*vollkommener Einschnitt*, itself divisible into two *Cäsuren* in Sulzer's definition of *Einschnitt*) two bars. Such segments combine to form the 'phrase' (*Satz*), defined as either 'opening phrase' (*Absatz*) or 'closing phrase' (*Schluss-Satz*). Phrases form a 'period' (*Periode*). All three principal words are grammatical constructs: *Einschnitt* as phrase, *Satz* as clause, and *Periode* as sentence, the third of these divisible, according to Koch, into 'subject' (i.e. first four bars, *enger Satz*) and 'predicate' (latter four bars).



J.-J. de Momigny: 'Cours complet d'harmonie et de composition', iii…

At the beginning of the 19th century came a work that gave an unprecedented amount of space and range of thought to analysis. Jérôme-Joseph de Momigny (1762–1842) in his *Cours complet d'harmonie et de composition* (1806) devoted no fewer than 144 pages, including analytical plates, to an analysis of the first movement of Mozart's String Quartet in D minor K421/417*b*. He provided a double analysis, examining both phrase structure and expressive content. Momigny's phrase-structure analysis is based on the novel rhythmic concept that musical units proceed from upbeat (*levé*) to downbeat (*frappé*) and never vice versa. He termed his smallest sense-unit, made up of two successive notes, upbeat and downbeat, the *cadence* or *proposition musicale*. These two notes are in the relationship of *antécédent* and *conséquent*. In the opening bars of the movement by Mozart (fig.3), two *cadences mélodiques* pair off in antecedent–consequent relationship to form a *cadence harmonique*, two of these forming a *hémistiche*, two *hémistiches* forming a *vers*, and two *vers* forming a *période*. Momigny's concept does not, however, insist on hierarchy by pairs, and allows for as many as six or eight *vers* to make up a *période* in certain contexts. The *périodes* form further into *reprises* and are designated according to function within their *reprise* as 'de début', 'intermédiaire', 'de verve', 'mélodieuse', or 'complémentaire'. (In other contexts Momigny used other terms from versification also to designate structural units of intermediate size: *distiche, strophe* and *stance*.)

In this phrase-structure analysis Momigny laid the basis for a view of music that was to become important at the end of the 19th century: of music as a succession of spans of tension. In his expressive analysis, on the other hand, he was looking back to the *Affektenlehre* of the 18th century. His method was to determine the *caractère* of the work under analysis, to select a verbal text that had the same character, and to set the text to the principal melodic material of the work so that melodic repetition was mirrored by verbal repetition, fluctuations of musical mood by fluctuations of textual meaning. He constructed a poetic parallel with the music, offering through it an interpretation of both form and content.



J.-J. de Momigny: 'Cours complet d'harmonie et de composition', iii…

The plates for the analysis present the music laid out on ten parallel staves; the top four show the quartet in conventional score, the fifth staff presents the melodic line (and notes printed small here reveal the beginnings of melodic reduction technique) with its *cadences* marked, the sixth and seventh staves provide a harmonic reduction of the texture with harmonic *cadences* marked, the eighth and ninth staves present the principal melodic material with poetic text underlaid (in this case a dramatic scene between Dido and Aeneas, with notes from the first violin assigned to Dido and from the cello assigned to Aeneas) and with simple piano accompaniment, and the tenth staff shows the roots of the prevailing harmony as a fundamental bass (fig.3).

Momigny's other extended analysis is of the first movement of Haydn's 'Drumroll' Symphony no.103 (Eng. trans., 1994). This spans 24 pages of text combined with 47 pages of annotated full score. The text first investigates the substance of the movement, proceeding period by period, examining the thematic material and its deployment, its use of contrasting dynamics and timbres, stressing the achievement of variety in unity; it then builds a poetic analogue to the music in the form of a village community terrorized by a fearful storm and eventually chastened in the eyes of God. This latter 'pictorial and poetic analysis' belongs to an 18th-century tradition of exploring the borderland between words and music – a tradition exemplified by Klopstock and Lessing, of which the most celebrated product was Heinrich Wilhelm von Gerstenberg's double adaptation of C.P.E. Bach's C minor Fantasy, first to the words of Hamlet's monologue 'To be, or not to be' and then to

those of Socrates' monologue as he takes hemlock (see Helm, 1972). Indeed, Momigny's writings suggest that there was a veritable school of such activity in Paris at this time. Grétry was a skilled exponent of this group, which Momigny called 'les parodistes'.

Momigny's two analyses from 1806 are monumental achievements. So too was another extended analysis, which occupied 21 columns of the Leipzig *Allgemeine musikalische Zeitung*, published in two instalments in July 1810: E.T.A. Hoffmann's analytical review of the score and parts of Beethoven's Fifth Symphony, complete with copious music examples (Eng. trans., 1994). Together three mighty analyses emerge from the head-waters of the broadening stream of 19th-century analysis. Superficially, Hoffmann's review has much in common with those of Momigny. Both deal in detail with matters of structure, both use highly technical language, both offer rich descriptive imagery. Hoffmann's pictorial language, however, belongs (as one would expect of him) to the world of Romantic literature, speaking of 'nameless, haunted yearning' and a 'magical spirit realm', and of the work being held together 'in a continuous fantastic sequence … like an inspired rhapsody'. His technical description, which freely uses such terms as *Hauptgedanke*, *Zwischensatz* and *Figur*, sees the music not in fixed format, through a series of periodic frames, but in free format, as a seamless continuity powered by motifs. It adumbrates an organicist view of musical structure, as for example (Eng. trans., p.163):

> "it is particularly the close relationship of the individual themes to each other which provides the unity that is able to sustain *one* feeling in the listener's heart. … It becomes clearer to the musician when he discovers the bass pattern that is common to two different passages, or when the similarity between two passages makes it apparent. But often a deeper relationship that is not demonstrable in this way speaks only from the heart to the heart, and it is this relationship that exists between the subjects of the two allegros and the minuet, and that brilliantly proclaims the composer's rational genius."

At one point Hoffmann's text sets out five forms of the Menuett theme so that the reader can see the transformations.

Schumann's review of Berlioz's *Symphonie fantastique* (1835) also combines objectivity and subjectivity in tackling the work from four distinct points of view: formal construction, style and texture, the poetic 'idea' lying behind the symphony, and the spirit that governs it. The review ranges itself against critics of the work, examining its structure section by section to show that 'despite the apparent formlessness … as regards its major proportions it possesses a wonderfully symmetrical disposition – to say nothing of its inner coherence' (Eng. trans., 1994, p.174); discussing harmonic and modulatory style, melodic and contrapuntal fabric, acknowledging the contravention of many theoretical rules but justifying them by the work's intensity, its 'wholly distinctive and indomitable spirit' (p.180); recounting the work's programme, and arguing that it spurs the listener's imagination to perceive its own further meaning; and finally affirming that the symphony 'has to be understood not as the work of art of a master, but rather as unlike anything that has gone before it by virtue of its inner strength and originality' (p.194).

The use of analysis to serve an interest in musical objects themselves, rather than to supply models for the study of composition, reflected a new spirit of historical awareness that arose with Romanticism. It was not a dispassionate 'scientific' interest in the past specimens, but a desire to enter into the past, to discover its essence. This spirit, in confluence with the Romantic image of 'genius', resulted in a new type of monograph, biographical and historical. An early example was J.N. Forkel's *Ueber Johann Sebastian Bachs Leben, Kunst und Kunstwerke* (1802), which, while including nothing that could be termed formal analysis as such, contained an extended characterization of Bach's music as a whole – in short, a stylistic analysis. Forkel was much influenced by the concept of 'organism' in contemporary philosophy and education; to seek the depths of 'Bach's transcendent genius' (Eng. trans., 1920, p.xxix) in the totality of his work rather than in individual compositions was consistent with this. He declared Bach's mastery of technique; at the same time he tried to define where 'Bach followed a course of his own, upon which the text books of his day were silent' (p.74). To identify genius he took, in chapters 5 and 6 ('Bach the Composer'), five aspects of music: harmony, modulation, melody, rhythm and counterpoint. His method was to cite a technical context, state the conventional in terms of contemporary theory or practice, and then consider Bach's handling of such a context. He thus had illuminating things to say about Bach's voice-leading, his use of passing notes, of pedal points, of remote modulations, his contrapuntal solo melodic writing, his fugal counterpoint and his use of the voice; for example

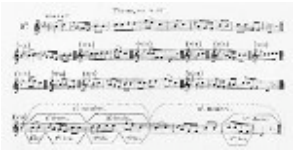
(p.77):

> "there is a rule that every note raised by an accidental cannot be doubled in the chord, because the raised note must, from its nature, resolve on the note above. If it is doubled, it must rise doubled in both parts and, consequently, form consecutive octaves. Such is the rule. But Bach freqently doubles not only notes accidentally raised elsewhere in the scale but actually the *semitonium modi* or leading-note itself. Yet he avoids consecutive octaves. His finest works yield examples of this."

For Forkel such transgression on Bach's part always produced a more natural, spontaneous or smooth effect than orthodoxy. The link between genius and nature was axiomatic: 'when [Bach] draws his melody from the living wells of inspiration and cuts himself adrift from convention, all is as fresh and new as if it had been written yesterday' (p.83).

The early decades of the century saw the publication of other comparable monographs, including Baini's study of Palestrina (*Memorie storico-critiche della vita e delle opere di Giovanni Pierluigi da Palestrina*, 1828), Carl Winterfeld's of Palestrina (1832) and Giovanni Gabrieli (1834) and Aleksandr Dmitreyevich Ulïbïshev's of Mozart (1843). In these, technical assessment was placed at the service of characterization of style; there was a critical and historical dimension to such writing that set it apart both from the field of composition teaching that had given rise to Koch's terminology and from the critical analysis of individual works exemplified by Hoffmann's review of Beethoven's Fifth and Schumann's of the *Symphonie fantastique*. Other writings pursued a third analytical path that derived from the model of the composition treatise but was focussed on the elucidation of pre-existing works – even where the work in question had been composed by the author, as in the case of the analysis by G.J. Vogler of one of his own preludes (1806; Eng. trans., 1994).

Perhaps the most striking aspect of the *Traité de mélodie* (1814, 2/1832) by the Czech composer and theorist Antoine Reicha is its citation of so many examples from actual music (he listed the composers in his preface). All these examples are submitted to segmentation and discussion. This in itself represents a significant shift from the compositional to the analytical standpoint – Reicha remarked in the preface to the *Traité* that 'It is with music as with geometry: in the former it is necessary to prove everything by music examples, just as it is with the latter by geometric figures'. Such a shift is emphasized by the inclusion of six extended analyses of works by Haydn (pp.40ff and ex.D^4), Mozart (p.43, E^4), Cimarosa (pp.43ff, F^4), Sacchini (pp.45ff, G^4), Zingarelli (pp.47ff, Q^4) and Piccinni (pp.49ff, R^4). Each piece is presented as a continuous melodic line annotated with brackets, labels and comments, and a page or two of discussion in the text.



From A. Reicha: 'Traité de mélodie' (Paris, 1814), Planches, 46

Reicha established a set of technical terms in the French language comparable to those of Koch, Riepel and Sulzer. He used *dessin* to denote the smallest unit of construction (equivalent to *Einschnitt*), and likened it to an *idée*; two or three *dessins* normally make up a *rythme* (equivalent to *Satz*), repetition or multiplication of which (the second of a pair being called the *compagnon*) produces the *période*. A composition made up of several *périodes* is a *coupe*: that of two or three *périodes* is a *petite coupe binaire* or *ternaire*, and that of two or three *parties*, each comprising several *périodes*, is a *grande coupe binaire* or *ternaire*. The *dessin* is punctuated by a quarter-cadence (*quart de cadence*), the *rythme* by a *demi-cadence*, the *période* by a *trois-quarts de cadence* (if repeated) or by a *cadence parfaite*. Koch's division into grammar and punctuation is mirrored in this view, as is his fundamental concept of hierarchical phrase structure. Thus Reicha took the theme of the last movement of Mozart's String Quartet κ458, 'The Hunt', and divided it into two *membres* (i.e. *rythmes*), each comprising two *dessins* of two bars' duration. Three of the four *dessins* are melodically distinct (his nos.1, 2 and 3), and Reicha broke each of these further into two sub-units, numbering five of them (nos.4–8) and still calling them *dessins*. All this is illustrated in his music example B^5, of which the first section is shown in **fig.4**.

Such writing could arouse the interest of the musical public. Around 1830 there was an intense debate in the pages of *La revue musicale* and the Leipzig *Allgemeine musikalische Zeitung* about the opening bars of Mozart's 'Dissonance' Quartet κ465 (see Vertrees, 1974), in which the protagonists were Fétis and an anonymous writer identified by the pseudonym 'A.C. Leduc'. The

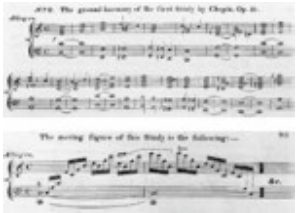
response to this by the Mannheim-based composer and theorist Gottfried Weber was widely circulated. Weber acknowledged the 'disturbing effect' of the passage, and stated that its causes may be ascertained by analysis (Eng. trans., 1994, p.163): 'A thorough-going *analysis* of the entire *harmonic and melodic fabric* [*Textur*] of the passage in question will enable us to detect all these causes, to isolate them and see them interacting with one another, and thus to specify *what* it is in these tonal constructs [*Anklängen*] that disturbs us so much'. Weber deployed a number of approaches. He considered the tonal scheme of the passage through the application of harmonic theory; he identified the proliferation of passing notes as a factor contributing to the effect of the music; he noted cross-relations between the voices, and parallel progressions at the interval of a 2nd; he reviewed 'the grammatical construction of the passage as a whole' and finally assessed its 'rhetorical import'. Weber did not claim that his analysis proved either the 'lawlessness' or the 'law-abiding quality' of the music (p.183): only the 'musically trained ear' could judge whether the tolerable 'limits of harshness' had been overstepped. Content himself to accept the judgment of Mozart, and to disregard 'fools and jealous ones', Weber nonetheless felt that his analytical approach had been able to establish what the effects consisted of and what intentions lay behind them: 'All that technical theory could have done, it has here done' (p.182).

Weber was also among those who in the first decades of the 19th century continued the work previously done in the area of harmonic theory by Rameau, Heinichen, Kirnberger and others. His four-volume theory of tonality (*Versuch einer geordneten Theorie der Tonsetzkunst*, 1817–21) was widely used and acknowledged: the work went through three German editions, and its American-English edition (published under the name of Godfrey Weber), translated by James Warner (1842), went through some six impressions; this edition was revised in 1851 by John Bishop of Cheltenham, the translator of Czerny and editor of Reicha. In §53 of the *Versuch* Weber set out a new method of designating chord types. This uses Gothic letters in upper and lower case, with superscript circle, '7' and crossed-'7', to designate major, minor and diminished triads, dominant 7th, secondary 7th, half-diminished 7th, and major triad with major 7th. Then in §151 there are Roman numerals, large and small (actually small-capital), with the same superscript symbols, to denote chord types as located on degrees of the scale within a given key. The two 'modes of designation', as described in §153, can be combined by prefixing an upper- and lower-case italic letter and colon to the Roman numeral as an index of the prevailing key; thus C:IV^{7} indicates the dominant 7th on the fourth degree of C major.

Weber claimed originality for these symbol-systems and complained of piracy by contemporary writers. The combined system just outlined provided the basis for Schenker's designation of fundamental harmonic steps (*Stufen*), and became widely used in 20th-century theoretical writings.

By far the most visionary steps in harmonic theory at this time, however, were taken by Momigny. Over a period of 18 years he formulated a theory of long-term tonality which enabled him to imply, for example, that the first movement of the Mozart D minor String Quartet in its entirety modulates (in the modern sense) a mere eight times, and that other extended passages normally regarded as modulating several times never leave the home key. While writing the *Cours complet* (1803–5) he evolved an expanded notion of tonality whereby a key comprised not only its seven diatonic notes but also the five flanking notes on the sharp and flat sides and a further five on the double-sharp and double-flat sides (relatively speaking), to produce a tonal space of 27 notes. Finally, in *La seule vraie théorie de la musique* (1821) that space is divided into diatonic genus, chromatic genus and enharmonic genus. By this formulation (derived from classical Greek music theory), most conventionally accepted modulation is classed as movement within this expanded tonal space – movement between areas called 'octachordes'. Such local movement within the tonal space is termed *modulation* (or *modulation négative*), whereas movement outside that space is termed *transition* (or *modulation positive*).

3. 1840–1910.



From C. Czerny: 'School of

When Carl Czerny translated Reicha's *Cours de composition* of 1816 and two *Traités* as *Vollständiges Lehrbuch der musikalischen Komposition* (Vienna, 1834), he contributed by way of an appendix an analysis of the first movement of Beethoven's 'Waldstein' Sonata, in which he stripped away the surface figuration ('the moving figure'), leaving only the underlying harmonies ('the ground-harmony'), presented in block chords. Czerny also did this later in his own *School of Practical Composition* (?1848) for Chopin's Etude op.10

Practical Composition' (London, c1849), 92–3

no.1 (fig.7), for the first prelude of Bach's *Das wohltemperirte Clavier*, i, and for the introduction to a sonata by Clementi; and he reduced a study by Cramer to its basic voice-leading ('the ground-melody').

All the music examples in Czerny's *School* are attributed (they represent the generation of Beethoven, Hummel, Rossini, Méhul etc.), and many analyses of whole compositions are included. The treatise was unique in being the first independent manual of form and instrumentation. It took for granted a grounding in harmony and counterpoint, and concerned itself exclusively with the development of ideas and the formation of compositions 'from the most simple Theme to the Grand Symphony, and from the shortest Song to the Opera and Oratorio' (i, p.iii). It is a veritable compendium of musical forms, including exotic dances (such as the bolero, fandango and tarantella and a section on Russian national dances), vocal forms (such as the *romance, preghiera* and ballad), as well as the constituent movements of a sonata, many other forms, and genres such as the quartet, quintet and sextet.

Czerny's attitude towards form was highly determinate: 'the composition must … belong to a species already in existence; consequently, in *this* respect, no originality is, in general, necessary' (i, 1). His understanding of '*form* and *construction*' is itself quite specific (i, 6):

> "1st [A work's] extent and proper duration."
>
> "2ly The requisite modulations, partly into established keys, and partly also into arbitrary and extraneous ones, as well as the places where they are introduced."
>
> "3ly The rhythm (the proportion or symmetry) both of the whole, and also of the individual parts and periods of a piece."
>
> "4ly The manner in which a principal or an accessory melody is brought in at the proper place, and where it must alternate with such passages as form either a continuation, a moving figure, or a bridge to the following."
>
> "5ly The conduct and development of a principal or accessory idea."
>
> "6ly The structure and proper succession of the different component parts of the piece, answerable to the species of composition which the author has had in view, as expressed in the title."
>
> "There are … a tolerable number of different forms in music. These, however, are reducible to a far lesser number of each principal form, as are totally different in their structure from one another."

A.B. Marx, in his *Die Lehre von der musikalischen Komposition* (1837–47; partial Eng. trans., 1997), was less procrustean. 'The number of forms is unlimited', he said, and there are ultimately no laws dictating what form a particular composition should take. For Marx, form was 'the way in which the content of a work – the composer's conception, feeling, idea – outwardly acquires shape'. A better term for it, he suggested, might have been 'the externalization of content'. Nonetheless, the student composer cannot learn composition through inspiration and idea alone. He needs the models of previous composers as an intermediate stage on the road towards free composition. Thus 'it is possible to *derive* certain *principal forms*, and also certain composite or *compound forms* which are made up of these or variations of them; and only by creating these distinctions does it become possible to comprehend and master the immeasurable array of [formal] moulds [*Gestalten*]' (ii, 5). For Marx, 'form' was almost synonymous with 'whole' (*Ganzes*) (ii, 4ff):

> "Every work of art must have its form. For every work of art has of necessity its beginning and its end, hence its extent. It is made up in different ways of sections of different type and number. The generic term for all these features is the *form* of a work of art. … There are as many forms as works of art."

Marx acknowledged that there were similarities in form between pieces, but denied strongly that forms were, as a result, 'routines' through which composers worked. Content was not really separable from form. Even so, the very appearance of similarities suggests that 'there must be some rationale underlying these moulds, some concept which is of broader significance, greater strength and longer duration' (ii, 7). Thus Marx denied form as 'convention' and proposed for it an epistemological basis. Forms are patterns abstracted from past practice, rather than conscious guidelines; they represent deep-seated principles of organization which analysis uncovers.

This idea is close to the ideas of A.W. Schlegel (1767–1845) concerning the relationship between art and nature: beneath the consciously moulded work of art must lie an unconsciously moulded work of nature. Nature 'is an intelligence. … [It should be understood] not as a mass of products but as itself a producing [force]' (*Vorlesungen über schöne Literatur und Kunst*, i, 1801–2). Very much abreast of the Romantic philosophy of his day, Marx believed in the originality of the artist, in genius as a special endowment, in the developing 'idea' as all-important, in rules as existing to be broken. Marx was also influenced by the outlook of the Swiss educationist Heinrich Pestalozzi (1746–1827), who saw the law of man's development as essentially 'organic' – not as a combination of circumstances but as an inner growth process. All processes have a starting-point, they germinate and grow, and at all points are harmonious and whole. At that starting-point Marx placed the *Motiv*, a tiny unit of two or more notes which serves as 'the seed or sprout of the phrase out of which it grows' (i, 27). In 1841–2 Marx engaged in public dispute with Fink over methods of teaching composition, showing himself fully aware of the philosophical basis of his position (see *Die alte Musiklehre im Streit mit unserer Zeit*, 1841; see also Eicke, 1966).

Marx's discussion of sonata form (*Sonatenform* – he was probably the first to use that term for the internal scheme of one movement) differs significantly from that of Czerny. Marx offered (ii, 498ff) a page of formal instruction on sonata form in the major key followed by twice as much indicating ways in which the 'ground-form' may be deviated from, stressing always that the spirit (*Geist*) of the composer may lead him in some other direction, and citing specific cases in Mozart and Beethoven. He pointed only to the unique balance of the key scheme, spelling it out in a highly original fashion, and recommended the composer to keep its advantages carefully in mind. The discussion was superseded when Marx issued the third volume of his compositional manual in 1845. There he devoted close on 100 pages to the topic, treating each of the principal sections of sonata form in turn, the design of each subject group (*Hauptsatz*, *Seitensatz*, *Schlusssatz*), the linkages between groups, the internal construction into antecedent and consequent, the use of motifs, ideas and cells. Significantly, he used the Beethoven piano sonatas as his exemplification throughout this discussion. Volume iii is itself a manual of musical forms that starts with simple forms, including variations, proceeds to rondo forms, to sonata form and thence to hybrid forms such as sonata-rondo, multi-movement structures and the fantasy, and concludes with vocal genres.

Marx's most significant analytical writing is contained in his *Ludwig van Beethoven: Leben und Schaffen*, which was first published in 1859 and continued to be reissued into the 1900s. This is a biography of the oeuvre rather than of the man – a sequence of analyses through which the development of Beethoven's art is traced. It contains extended analyses of all the symphonies, *Fidelio*, the *Missa solemnis* and several of the quartets. Many other works receive briefer analytical treatment. It is in this book that the concept of developing the idea is exploited most fully, especially in the chapter 'The *Eroica* Symphony and Ideal Music' (i, 275; Eng. trans., 1997), which expounds the aesthetic basis of 'idea'. The chapter on the Ninth Symphony (ii, 260) shows Marx's idealistic analytical technique at its best. His introduction to the performance of Beethoven's piano sonatas (1863) is alleged to be an outgrowth of this book. As well as giving advice on matters of execution, it supplies brief analyses of most of the sonatas, motivic and descriptive.

The latter part of the 19th century, and the early part of the 20th, saw the production of a growing number of books, pamphlets and other writings on musical subjects to meet the demands of pedagogical expansion. Though harmony texts also became numerous in this period, it was musical form above all that provided the material for such works. Some, perhaps because they were entirely directed at the lay reader, did not make explicit their intellectual sources and influences; but

others chose also to contribute to and develop what was by now an established tradition of ideas. Marx's *Die Lehre von der musikalischen Komposition* went through six editions during his lifetime, and an English translation of the fourth edition was issued in 1852. The work eventually underwent revision by Riemann between 1887 and 1890 (i, rev. 9/1887; ii, rev. 7/1890; iv, rev. 5/1888), and was used in theory teaching well into the 20th century, exercising a profound influence on generations of musicians. In 1885 Salomon Jadassohn produced volume ii*a* of his composition treatise, entitled 'Forms in musical works of art analysed and graded as a course of study'. In 1887 the American writer A.J. Goodrich published his *Complete Musical Analysis*, and the American teacher Percy Goetschius produced a sucession of books on musical form, of which his *Models of the Principal Musical Forms* (1894) was the first. Riemann's own *Katechismus der Kompositionslehre* (subtitled *Musikalische Formenlehre*) appeared in 1889. In 1908 Stewart Macpherson produced his *Form in Music*, which was the standard manual for English music students for much of the 20th century.

Among those who expressed themselves indebted to Riemann – a prolific and influential writer whose works covered an enormous range of musical subjects – was the British theorist Ebenezer Prout, who between 1893 and 1897 produced his two volumes *Musical Form* and its sequel *Applied Forms*. Prout took from Riemann his fundamental principles of rhythm, and in particular the study of motifs, and admitted that both volumes had involved intensive study of 'large German treatises'. The first volume proceeds from motif to 'phrase' and 'sentence', and then to simple binary and ternary forms, the second from dance forms to sonata form and vocal music, including a chapter on 'cyclic forms' which deals with the symphonic poem. Hugo Leichtentritt completed his *Musikalische Formenlehre* in 1911, later to become the first part of a more extended study (Eng. trans., 1951) including chapters on 'Aesthetic ideas as the basis of musical styles and forms' and 'Logic and coherence in music'. It also had detailed analyses of works, notably a 45-page study of Bruckner's Eighth Symphony and a chapter devoted to Schoenberg's piano pieces opp.11 and 19. It was with Prout and Leichtentritt that *Formenlehre* became a branch of the discipline of musical analysis rather than a prescriptive training for composers, and hence entered the field of musicology.

Approaches to harmony in the second half of the 19th century showed a tendency to divide into two camps: on the one hand those that took a conservative approach to theory but developed new insights born out of analytical pragmatics, and on the other hand those that brought a new rationalism to theory but had less impact on the practice of analysis. An example of the first kind is to be found in *Die Grundsätze der musikalischen Komposition* (1853–4) by the influential Viennese teacher Simon Sechter. Sechter's harmonic system took over the concept of fundamental bass originated by Rameau and transmitted via Heinichen, Kirnberger and Schulz. He developed a theory of chord progression based on correct succession of 'fundamental notes' and the 'underlying harmonies' (*Grundharmonien*) that they project. Sechter used the notion of harmonic step (*Stufe*), and he defined notes as either *leitereigen* (diatonic) or *leiterfremd* (literally 'alien to the scale'). 'Beneath every chromatic progression lies a diatonic one'; most chromatic harmony can be read as diatonic harmony with chromatic inflection; and most 'apparently modulatory passages in reality retain their allegiance' to the tonic. Fundamental notes must be diatonic to a major or minor scale, whatever goes on over them, but a subordinate *Stufe* of one key may become the tonic of a new key, thereby permitting transition from key to key. Some chords are described as 'representing' a fundamental that they do not contain (*Stellvertreter*: '[root] representatives'). Other chords are seen as belonging to two key areas (*Zwitterakkorde*: 'hybrid chords'). Although Sechter's approach looked back to Rameau, it also marked a major step in coming to terms with 19th-century developments in harmonic language; it influenced many generations of musicians, of whom Schoenberg is perhaps the most prominent example.

Another link between old and new in mid-century was the *Lehrbuch der musikalischen Komposition* (1850–67) by J.C. Lobe. Lobe used a system of designation similar to that of Gottfried Weber's *Versuch* several decades previously, but rather cruder: thus C:3 denoted the (minor) triad on the third degree of C major; a:5, the dominant 7th on the fifth degree of A minor; h:2°, the chord of the 9th on the second degree of B minor. Like Sechter's discussion of harmony, Lobe's is centred on the notion of *Stufe*. It makes a distinction between the progressions that are diatonic (*leitereigen*) and those that are modulatory (*ausweichend*); the concept of the altered (*alterirt*) chord allows chords with foreign harmony notes to be viewed as diatonic in certain contexts, thus increasing the power of the harmonic step greatly (i, 242ff). Lobe, it should be said, claimed credit for only part of this thinking – thinking that looks forward to the harmonic approaches of Schenker and Schoenberg.

Sechter's third volume (1854) speaks of 'rhythmic sketches' and makes use of two noteworthy graphic devices. The first sets out the harmonic structure of an entire piece in terms of

fundamentals whose durations are undifferentiated but which are marked off into phrases (*Abschnitte*) by commas (shades of Mattheson). The second presents a fully rhythmicized succession of fundamentals with two rows of numerals immediately beneath the staff. These numerals denote for each fundamental in turn the *Stufe* which it forms of either or both of two prevailing key areas. This graphic technique was adopted and elaborated by several analysts, notably in the quest for a theoretical formulation of the harmony of Wagner: fig.8 [not available online], from an analysis by Karl Mayrberger, is a good example.

Although Mayrberger acknowledged his debt to Sechter, he also claimed to have built on the thinking of Moritz Hauptmann, whose *Die Natur der Harmonik und der Metrik: zur Theorie der Musik* (1853) was conditioned by Hegelian philosophy, and who did much to introduce the idea that music theory should be systematic and founded on logical principles. He formulated (1853) a theory of harmony and rhythm based on what he claimed to be universals. His theory of rhythm, like that of Momigny, took a two-element pattern as its basic unit and explained all units comprising more than two elements as intersections of two-element units. In Hauptmann's Hegelian terms, a two-element unit was the 'thesis', a three-element unit the 'antithesis' and a four-element unit the 'synthesis' in the metrical system. But Hauptmann's basic unit, unlike Momigny's, was made up of downbeat followed by upbeat, and it was Mathis Lussy who in his study of the anacrusis (1874) took up Momigny's *levé–frappé* pattern and developed the theory further. From this Riemann proceeded to develop a full theory based on the indivisible unit of the *Motiv*. The bulk of it appeared in his *Musikalische Dynamik und Agogik* (1884) and *System der musikalischen Rhythmik und Metrik* (1903); the theory was summarized in the *Vademecum der Phrasierung* (1900; 8/1912 as *Handbuch der Phrasierung*).

Underlying Riemann's theory is the postulate that the pattern weak–strong is the 'sole basis for all musical construction' (1895–1901, i, p.132). This fundamental unit is termed the *Motiv*: it represents a single unit of energy (*Lebenskraft*) passing through phases of growth, peak and decay. It is thus a dynamic trace, a flux, and is far removed from the traditional notion of 'beats' in a 'bar', each beat being separate and having its own 'weight'. Musical form is constructed of many such units overlapping and interacting to produce extended and compressed spans of energy. These interactions occur against a 'background' of absolutely regular hierarchically built-up patterns: where two *Motiv* units occur in succession they form the two elements of a *Motiv* at the next level of structure, the first forming the growth phase, the second the stress point and decay phase. In turn, two such larger *Motiv* units form a still higher-level *Motiv*, and so on in a hierarchy. The result is a kind of conceptual grid, made up of equal units of energy and bearing an intrinsic relationship to the topography of the music. Given this theory, the process of analysis is one of locating the lines of the grid behind the articulated surface of a piece or passage.

From H. Riemann: 'Präludien und Studien', i (Frankfurt, 1895), 163

A piece that was slavishly aligned to its grid would be made of regular modules, each comprising eight bars of 2/4 or 3/4 and pairing off into 16-bar, 32-bar, 64-bar and so forth units at higher levels. The eight-bar module is shown for 2/4 in **fig.9** (*Zweitaktgruppe* is Riemann's term for a pair of *Motiv* units in weak–strong relationship: *Halbsatz* for a four-bar unit – either antecedent or consequent; *Periode* for an eight-bar module: 1895–1901, i, p.163). But in practice music adopts certain 'symmetry-disturbing processes', some of which stretch or compress the grid, others of which temporarily upset the internal relationships without affecting the regularity of the grid itself. Chief among these are: (*a*) elision (*Auslassung*) – the suppression of the growth phase of a unit, thus yielding a strong–weak–strong pattern; (*b*) cadential repetition – restatement of the stress point and decay phase of a unit at any level of structure (a classic example is the introduction to Schubert's Symphony no.9; **fig.10**); (*c*) dovetailing – a transfer of function whereby a final stressed unit is converted into an initial unstressed one; (*d*) general upbeat (*Generalauftakt*) – a large-scale upbeat, often occupying only the space of the upbeat to a *Motiv* but functioning as the upbeat to a larger formal unit; and (*e*) appended *Motiv* (*Anschlussmotiv*) – a subsidiary phrase unit placed immediately after the strong beat of a main phrase unit, serving to generate a second strong beat where a weak beat would normally occur. The first three of these processes alter the temporal distance between points on the grid; the last two may alter the impression of such distance but do not necessarily alter the number of intervening beats.

Riemann's own analyses take one of two forms: books of analyses (those of Bach's '48', 1890, and Beethoven's string quartets, 1903, and piano sonatas, 1918–19), or 'phrase-structure editions' (of sonatas of Mozart, Beethoven and Haydn). The latter are editions that use special phrase-marks and signs, and number the bar-functions beneath the staff. The former adopt as their method of presentation the 'continuity line' – a single staff that shows all the main thematic

material, accompanied by the special signs and numbering used in the editions, and employing also Riemann's system of harmonic symbols (fully explained in his *Handbuch des Generalbass-Spiels*, 4/1917, pp.12ff). These books also use conventional terminology when dealing with thematic material and aim at fully rounded 'technical and aesthetic analyses of pieces of music'.

In 1887 a writer who rejected both the formal analytical approach and that of naturalistic description, and was at the same time mistrustful of historical information, began publication of a guide to the concert repertory, *Führer durch den Konzertsaal*. This was the musicologist and conductor Hermann Kretzschmar. The first edition of his guide contained a very large number of analyses that Kretzschmar had written during earlier years for the benefit of his concert patrons. The analyses were classified into 'Symphony and Suite', 'Sacred Works' and 'Oratorios and Secular Choral Works', each category arranged in order by date of composition. The *Führer* was extremely popular: it went through many editions and, though already a vast undertaking, was constantly enlarged as it did so. By 1919 it was over 2000 pages long and its historical scope spanned nearly 300 years – from Monteverdi to Mahler.

Kretzschmar forged an approach to musical appreciation that saw music as a language, universal in character, with meanings recognizable by those with the necessary aesthetic training (*Satzästhetik*). Such training brought with it an instinctive sense of how a phrase should be performed, a perception of the inner character of the phrase. At the end of this training stood a method of interpretation that Kretzschmar called 'musical HERMENEUTICS', and which he saw as a revitalization of the Baroque theory of affects. In the first of two articles promoting this method (*JbMP 1902*, *1905*) Kretzschmar defined hermeneutics as follows (see Bent, 1994, ii, 22–5, 106–7):

> "In every field its aim is the same – to penetrate to the meaning and conceptual content [*Sinn und Ideenhalt*] enclosed within the forms concerned, to seek everywhere for the soul beneath the corporeal covering, to identify the irreducible core of thought [*reinen Gedankenkern*] in every sentence of a writer and in every detail of an artist's work; to explicate and interpret [*zu erklären und auszulegen*] the whole by obtaining the clearest possible understanding of every smallest detail – and all this by employing every aid that technical knowledge, general culture and personal talent can supply."

Kretzschmar sought to attack the free poetic description of music which many writers of the time indulged in, and to show how his own method was both firmly based on technical criteria and also capable of illuminating whole compositions rather than merely individual passages. At the heart of the method was 'thematic character' as defined by interval and contour. In these terms, the subject of the C major fugue of Bach's *Das wohltemperirte Clavier*, i, has an 'energetic disposition' which 'rests on the motif of the 4th as the principal element of the melodic structure'; but 'with the descending final phrase and the cautious approach to the main motif, the flow of the unmistakable energy which forms the middle section is framed on either side with expressions of melancholy' (*JbMP 1905*, p.282).

Hermeneutics as a critical method – as distinct from its etymological roots in a more general 'interpretation' – is generally acknowledged to have first been formulated in the work of Friedrich Schleiermacher and later developed by Wilhelm Dilthey. It was most likely the latter who influenced Kretzschmar in his use of the term to describe his own analytical writing, and in his indentification of Hoffmann and Schumann (see §2, above, for discussion of their analytical reviews of Beethoven and Berlioz) as being among his earlier precursors.

One may also find earlier examples of hermeneutic critical analysis in two renowned composer biographies: Otto Jahn's *W.A. Mozart* (1856–9) and Philipp Spitta's *Johann Sebastian Bach* (1873–80). Jahn's *Mozart* contained many analyses of individual works, often very detailed, sometimes occupying whole chapters. The more technical analyses tended to approach their subject from three points of view: external form, thematic character and use of instruments or voices. Even when Jahn drew certain groups of works together for consideration as genres – the early instrumental works, the piano music, the symphonies and so on – he generalized only on matters of form before dealing with works individually; but in these chapters there were also valuable comparative analyses of two or more works. In Spitta's *Bach* there was rather less formal analysis and much more on musical character. Spitta aimed, by description, 'to call up the spirit which alone can give [music] life and soul' (Eng. trans., i, p.viii). Spitta went further and attempted a symbolic

interpretation, notably for the B minor Mass: for example (iii, 51):

> "to represent the essential Unity as clearly as possible, Bach treats the parts in canon on the unison at the beginning of the principal subject each time, not using the canon on the fourth below till the second bar; thus both the Unity and the separate existence of the two Persons are brought out."

Wagner's music dramas were fertile ground for the production of analyses that aimed at 'elucidation' (*Erlaüterung*). This was the word used by Hans von Wolzogen to describe his work. Encouraged by Wagner himself and also by Liszt, von Wolzogen published a 'thematic guide' (*thematischer Leitfaden*) to the *Ring* cycle (1876), followed by similar guides to *Tristan und Isolde* (1880) and *Parsifal* (1882). Von Wolzogen's writings combine synopsis of the plot and stage action with the identification of motifs and descriptive paraphrase of their musical treatment. He was not the first writer to identify motifs in Wagner's works by name, but his writings achieved wide currency and authority, and his method was taken up over the following decades by others, both in connection with Wagner (as late as Newman, 1949) and with the works of other composers. To the extent that his work spawned popular imitations, von Wolzogen's caution in identifying motifs with specific words and images, and his restricted use of the term 'leitmotif' to describe 'a cluster of definable separate motifs … linked by organic mutation' (Bent, 1994, ii, p.91) have been obscured. It may be noted in passing that von Wolzogen's analysis of *Tristan* was a direct influence on Mayrberger's, though their methods and purposes were quite different.

Towards the end of the century, writing that moved in a hermeneutical way across a number of modes of interpretation had come to be influenced by the development of musical text criticism, which brought with it the first of the massive collected editions (*see* **EDITIONS, HISTORICAL** and **MUSICOLOGY, §II, 3**). The most notable scholar in this field was Gustav Nottebohm, who worked on the collected editions of Beethoven (1862–5) and Mozart (from 1878). In a long series of studies of sketches and other composition materials, published between 1865 and 1890, he tackled the problems of Beethoven's creative processes: how many pieces Beethoven worked on at a time, how he used sketches, drafts and scores, how he worked from single-line draft to full texture, how he conceived and modified formal structure. What Nottebohm came across on the way, namely Beethoven's painstaking formulation of thematic material, was a living exemplification of the ideas of melodic motif, germ-cell, organic growth, unity – ideas that were rife and which had found their way into the theoretical tradition. Here was a way of getting behind the finished text, of showing the composition student how a masterpiece was put together, errors, false starts and all, and at the same time of verifying one's deductive analyses.

This prospect was bound to be attractive to those seeking to produce elucidatory analysis. One of the first such writers to draw on Nottebohm's findings was George Grove. Each of the analyses in *Beethoven and his Nine Symphonies* (1896) presented a rounded picture of its subject, with a balance of historical and biographical information, text-critical evidence and formal analysis – both plentifully illustrated with music examples – and critical judgment. Each concluded with a survey of the work's critical reception. Grove adopted a narrative approach for his formal analyses which has since become the stock in trade of descriptive writers on music – by animating the orchestra ('This is prolonged by the wind instruments in a humorous passage') or the piece itself ('after a reference back … a new subject appears … as harsh and uncompromising as the first subject') or by treating the listeners as visitors ('After this we arrive at a pause'). Grove differed from Kretzschmar, however, in refusing to be influenced by the idea of motivic growth. The tangible evidence of how a theme came about was of interest to him, and he was ready to point out similarities between the themes of different composers, but he interpreted these as a matter of historical influence rather than something around which to create theories of musical structure.

4. 1910–45.

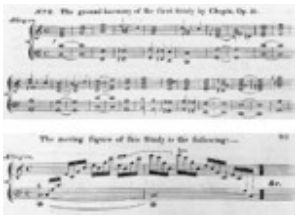
Around the turn of the 20th century experimental research gave a scientific basis to some of the recently emerging attitudes towards musical experience. It was observed above (§3) that A.B. Marx, while using the word *Gestalt* for a formal 'mould', regarded 'form' as virtually synonymous with 'whole' (*Ganzes*). He felt, too, that formal 'moulds' were not merely conventions: they represented deep-seated principles of organization in the human mind. By the time of Prout and Leichtentritt a new branch of psychology was emerging, which laid emphasis on perception rather

than on motivation: Gestalt psychology.

In essence Gestalt psychology was concerned with form (in keeping with the views of Hanslick, 1854, and of J.F. Herbart, 1811): it laid stress on the power of the perceiver mentally to organize whatever objects or situations he encounters, and to do so in formal terms rather than terms of individual components and his previous experience of them. Thus visually, objects that are in close proximity to each other, and objects that are similar in shape or colour, tend to be perceived as a group. Moreover, the perceiving mind seeks the simplest available grouping, looking for basic, complete shapes – for 'continuous wholes'. It looks also for repetition and symmetry, for equal separation in space and time. In short, it tries to place the simplest, most regular, most complete interpretation on the data before it.

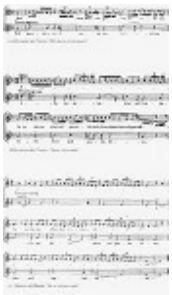
Musical sound was used for illustrative purposes by the early Gestalt psychologist Christian von Ehrenfels. He pointed, in 1890, to the fact that a melody does not lose its melodic identity when transposed, despite the change of each note: a melody has a shape that can be heard, recognized and learnt without recognition of its constituent notes, intervals or rhythms. Perception of the shape comes not as a slow process but as a flash of insight; it is like the completion of an electric circuit.

There are three principles that relate to this. 'Closure' is the principle whereby the mind, when presented with a shape that is almost but not quite complete, will complete the shape automatically. 'Phi phenomenon' is the principle whereby the mind, when confronted with two separate occurrences, may link them together and attribute movement from one to the other. 'Prägnanz' is the principle whereby the mind will look for the interpretation of data that yields the most 'pregnant' result – the 'best' interpretation. All these processes can be seen at work in, for example, perception of a lute transcription of a 16th-century vocal piece, where the original vocal lines are presented only incompletely because of the limitations of lute technique; or in a solo violin or cello work by Bach, where several contrapuntal lines are carried, all of them incompletely yet with a general sense of the polyphony.



From C. Czerny: 'School of Practical Composition' (London, c1849), 92–3

One final principle is of fundamental importance to music: figure–ground perception. Very often the mind selects from the data before it only certain salient features; these it organizes as a 'pregnant' figure (*Gestalt*), leaving the rest of the data to remain in the field of perception. Ultimately only the figure is passed up from the nervous system (where this organization of sensory experience takes place) to the psychological field where it is 'understood'. The rest of the data remains as the 'ground'. This subconscious process is simulated in a procedure the musical analyst calls 'reduction', an early example of which is Czerny's stripping away of surface ornament in Chopin, Bach and Clementi to reveal the underlying essential structure (see §II, 2 above and **fig.5**). Significantly, but quite conversely to Gestalt terminology, Czerny called the surface ornament 'the moving figure' and the structure 'the ground-melody' or 'the ground-harmony'.



From A. Schering: 'Das kolorierte Orgelmadrigal des Trecento', 'SIMG', xiii…

The first full-scale use of Gestalt procedures was probably Arnold Schering's examination of the 14th-century Italian madrigal (1911–12). In it he introduced the idea of 'disembellishment' (*Dekolorieren*). This involved removing groups of short note values from melodic lines and substituting fewer notes of proportionately longer value to occupy the same amount of time: 'laying bare from within a melismatic passage the simple melodic progression'. **Fig.8*a*** shows an example of this (the reduction technique shows elements of 'closure' and 'Phi phenomenon', and is a clear example of figure–ground perception). Schering called what he uncovered 'melodic kernels' (*Melodiekerne*) or 'cells' (*Keime*), both terms being familiar from the organic music theorists of the 19th century. But in fact what he set out to reveal were medieval folksongs, since he believed that the elaborate 14th-century madrigals were really keyboard arrangements of folktunes. Such a theory is not inconceivable: there were keyboard arrangements in the 14th century, and Schering was simply reversing the procedure known as **PARAPHRASE** whereby a melody, usually a passage of plainsong, was embellished in one voice of a polyphonic composition in the late Middle Ages and Renaissance. The difficulty lay in verifying the results as folksongs, and Schering adopted the interesting confirmatory device of reducing two different madrigals by different composers to the same underlying melodic progression. The two madrigals had the same poetic text, and Schering's assertion was that they both presented elaborated versions of the original folk melody for these words (**fig.8*b*** and **fig.8*c***). Schering's work

provided in embryonic form the techniques for both the melodic evolutionists (Réti, Keller and Walker) and also the work of Heinrich Schenker in structural harmony.

It was one of the greatest figures of historical musicology, Guido Adler, who attempted through his book *Der Stil in der Musik* (1911) to change the nature of historical writing about music by introducing the notion of style as the central concern of the historian. As early as 1885 Adler had published a programme for the future of musicology, placing strong emphasis on analysis, arguing for its rightful place in historical inquiry. He set out a series of criteria for the examination of structure in a work, under general headings such as rhythmic features, tonality, polyphonic construction, word-setting, treatment of instruments, and performing practice. In *Der Stil in der Musik* Adler criticized his contemporaries for making history out of a string of composers' names. What was necessary, he believed, was the formulation of a terminology adequate for the description of music 'without names to prop it up'. If music could be described in this way then it would become possible to compare work with work, and thus – in the dynamic terms that Adler used – to specify what features 'link works together'.

Music history was to Adler like a self-weaving textile whose threads, of different colours, thicknesses and strengths, were features of style. Threads might discontinue, change colour, change places or merge. Thus he spoke of 'stylistic direction' (*Stilrichtung*), 'stylistic change' (*Stilwandel*), 'stylistic transfer' (*Stilübertragung*), 'stylistic hybridization' (*Stilkreuzung*), 'stylistic mixing' (*Stilmischung*) (pp.19–48). His view of art was as an organism. Everything in it could be accounted for; nothing occurred by chance (p.13):

> "The style of an epoch, of a school, of a composer, of a work, does not arise accidentally, as the casual outcome and manifestation of artistic will. It is, on the contrary, based on laws of becoming, of the rise and fall of organic development. Music is an organism, a plurality of single organisms which in their changing relationships and interdependencies form a totality."

Adler sharply criticized what he called the 'hero-cult' – that is, history written in terms only of leading composers: 'the edifice of style is built out of minor figures just as much as major, and all need investigation if the true picture is to appear'. (It is significant that Adler had been the prime mover in the Austrian national series of editions, Denkmäler der Tonkunst in Österreich, of which he was editor from 1894 to 1938; he must have been particularly conscious of the need to place lesser composers in historical perspective.) The task that he set the historian was to observe and apprehend that edifice of style in an essentially scientific manner; for 'style is the centre of the handling and comprehension of art … it is the yardstick by which everything in the work of art is measured and judged' (p.5). He placed emphasis on 'apprehension' as the first stage: that is, a recognition of the facts purely as they are, which avoids value judgments and subjective preconceptions on the part of the historian.

Adler offered two methods of approaching this task, and it is here that his work is important for the analyst. One method is that of taking several pieces and examining them to identify what they have in common and how they differ. This is Adler's 'inductive method', by which the historian can perceive the forces that cause an established group of works to hold together; he can discover which works in a random collection are relatively close in style and which more distant; or he can trace links between works composed in chronological succession. The other, the 'deductive method', is to compare a given work with surrounding works, contemporary and preceding, measuring it against them by set criteria and establishing its position within them. Such criteria are the use of motif and theme, rhythm, melody, harmony, notation and so forth. Other criteria concern the function and medium of music: sacred or secular, vocal or instrumental, lyrical or dramatic, courtly, virtuoso and so on. Adler's book is far from a manual of stylistic analysis. It does not offer method in detail. It was a laying of foundations in which Adler sought to establish a 'framework of laws' (*Rahmengesetz*) by which style operates and within which research could proceed.

From G. Becking: 'Der

Adler made a particular study of the Viennese Classical style. Wilhelm Fischer too, his assistant from 1912 to 1928, completed a dissertation on the genesis of that style in 1915. Two other scholars pursued stylistic studies in scholarly fashion at this time, Ernst Bücken and Paul Mies, notably in their joint article on the foundations, methods and tasks of stylistic research into music (1922–3). Both also worked on Beethoven; indeed, Beethoven

musikalische Rhythmus als Erkenntnisquelle' (Augsburg, 1928),…

became a centre of attention for studies of personal style, with Gál's examination of individual features in the young Beethoven (1916), Becking's of Beethoven's personal style (1921), Mies's of the meaning of the sketches for an understanding of Beethoven's style (1925), Schiedermair's of the young Beethoven (1925), August Halm's of middle-period works (in *Beethoven*, 1926) and Engelsmann's of Beethoven's levels of composition (1931). Other studies of personal style include Danckert's 'Personal types in melodic style' (1931), later enlarged as 'Primal symbols in melodic formation' (1932). Becking was particularly interested in rhythm as a determinant of individuality (1928) and devised a set of graphic devices, known as 'Becking curves', for representing the rhythmic 'national constants' and 'personal constants': **fig.9** shows the curves for the 18th-century Italian-German mixture of styles represented by Handel, and for Wagner's early style.

The most distinguished and influential example of stylistic analysis at this time was, however, Knud Jeppesen's *The Style of Palestrina and the Dissonance*, first prepared as a doctoral dissertation in Danish in 1922, and subsequently translated into German in 1925 and English in 1927. Jeppesen provided in this book the detailed analytical procedure that Adler had left wanting. His choice of 'inductive' or 'deductive' method was conditioned by his general purpose: he saw the need for a history of dissonance treatment. He felt that modern manuals of counterpoint, based on Fux (*Gradus ad Parnassum*, 1725), lacked precisely that historical account, that 'genetic' growth of dissonance treatment, which would illuminate the development of musical style in time and place from the Middle Ages to the late Renaissance and from there to the end of the 18th century (pp.3ff):

> "Passing from an absorbing study of Gregorian music to primitive polyphonic forms, from the style of Palestrina to the commencement of dramatic music, or from Bach's polyphony to the classical art of Vienna, would be the best manner of proceeding for recognizing immediately the essential peculiarities of the new style."

In taking Palestrina as his special study Jeppesen was starting with a 'central' point, and a stable one, from which he could look backwards (since Palestrina's work was a 'vast summary of the musical development of the preceding centuries') and forwards. At the same time he was starting with the best-known phenomenon in the field, and investigating it against a background which was in his terms virtually uncharted. He was therefore driven to the 'inductive' method, with no established criteria and only the possibility of comparing case with case until such criteria began to appear.

Jeppesen himself called this method 'empiric-descriptive', and identified it expressly with Adler's method. He stated it clearly (p.8):

> "through comparison of variants of homogeneous forms of [the] language [of music] – whether taken from contemporary or from historically separated periods – to indicate and fix common qualities, which with certainty can be supposed to possess the essential accentuations of these forms. The material thus obtained may then serve as a basis upon which to build up the laws of the language, the laws of musical evolution. These, psychologically translated, finally develop into certain regulations and directions of will – the hidden force behind these laws."

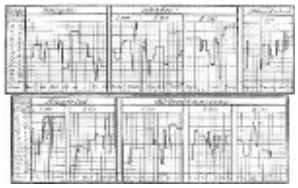
Jeppesen in this way extended Adler's inquiry from the surface of music, considered empirically, to the subconscious controls of style, considered psychologically. In so doing he enunciated the motivation for later developments in feature analysis, including computer-assisted analysis. The aspect of Jeppesen's work that makes it scientific is the fact that the analyst is not selecting and summarizing: he is presenting the entire data for each case and adducing laws from it objectively.

Jeppesen presented first an account of Palestrina's melodic style (pp.48–84) with regard to pitch contour, rhythmic flow and the width and direction of intervals. The preliminary work for this analysis must clearly have been an exhaustive search through every vocal part of Palestrina's entire output (in the Leipzig collected edition of 1862–1903) in order to count and note every interval in relation to its metrical placing. Thus he located and listed for the reader (p.55, note 3) the occurrence of major 6ths and descending minor 6ths as 'dead' intervals (i.e. between two phrases

rather than during a phrase: 32 cases in all). The investigation of upward leaps in rhythmic context led to the uncovering of a subconscious law: 'on considering the style with regard to crotchets … we meet with the astonishing fact, not previously observed, that a rule (almost without an exception) forbids the leap upward from an accentuated crotchet' (p.61). By contrast, Jeppesen listed no fewer than 35 melodic patterns in which a downward leap occurs from an accented crotchet, and charted all the places in which these patterns occur. It is in the much larger second discussion, that of dissonance treatment (pp.84–287), where he defined each dissonance in turn and discussed its degree and manner of use by Palestrina, that Jeppesen entered into historical comparison. Thus for example he considered the use of the 'portamento dissonance' (the anticipation of a note on a weak beat), stating: 'by Palestrina it was most frequently employed immediately before a syncope [i.e. syncopation] and in descending movement … though the syncope is not an invariable condition' (pp.184ff). He then contrasted this limitation with the use by other composers, citing cases in Josquin, Obrecht, Carpentras, Cara and La Rue.

One of Adler's pupils was Ernst Kurth. Kurth's ideas were closely allied to those of the Gestalt psychologists, but also used Schopenhauer's concept of the 'Will' and Freud's of the subconscious mind. The Gestalt theorists saw three levels of aural perception: physical perception by the ear, sensory organization in the nervous system, and understanding at the psychological level. Kurth saw three levels of activity in musical creation, which he expounded as part of his theory of melody in the first part of *Grundlagen des linearen Kontrapunkts* (1917). The first of these levels is the operation of the 'Will' (which in art is unselfish and disinterested) in the form of kinetic energy (*Bewegungsenergie*); this, a continuous flow, is the living power of music; 'the origin of music … is the will to move'. The second level is the psychological: the submerged stirrings of the unconscious mind draw on this energy to produce a 'play of tensions' (*Spiel von Spannungen*), each tug of tension describing an arc of growth and formation (*Ur-Formung* or *Erformung*). This play of tensions does not become conscious until the moment that it takes form in musical sound – the third level, the acoustic manifestation (*Erscheinungsform*). Because these three levels are activated one after the other to produce melody, the resultant line has unity and wholeness. Its shape is conceived before either notes or harmonic implications are brought into play; it is thus a 'closed progression'. This is the essence of Kurth's concept of the 'linear'. He saw it particularly at work in the music of Bach – a texture made up of lines, each of which is powered by kinetic energy and internally unified, and which make harmonic sense together only as a secondary phenomenon. This is what Kurth called 'linear counterpoint'. He evolved a concept of 'linear phase', a unit of growth and decay, quite separate from the conventional idea of 'phrase' in that it did not depend on rhythmic patterning, only on proportion and contour. The motif was such a phase: unified, distinctive, not losing its identity when its pitches, intervals and durations are modified (pp.21ff, 68ff).

Notes forming a melody contain kinetic energy; notes forming a chord contain 'potential energy'. Tonal harmony is a system of internal coherence, carrying the possibility of change, brought about by potential energy. The most powerful tension in this system is that of the leading note. In his second book, on Romantic harmony (1920), Kurth first expounded chromatic alteration as a process of placing the leading note where it would not normally occur. He distinguished between two forces at work in Romantic harmony, creating a polarization: 'constructive' and 'destructive' forces (pp.272ff). It is the cohesive forces of tonality that are constructive, and the dissolving forces of chromaticism that are destructive: alteration, the use of chords of the 7th or 9th in place of triads, and the use of chords for colouristic effects. Kurth took Wagner's *Tristan*, and in particular the many statements of the famous 'Tristan chord', as the central material for this book; it contained little actual analysis, yet it offered a new perspective for handling the large-scale tonal structure of Wagner's operas, giving insight into long-term tonal relationships despite pervading chromaticism and movement to remote key areas for long periods.


From A.O. Lorenz: 'Das Geheimnis der Form bei Richard Wagner',…

The scholar who grasped the problem of form and tonality in Wagner and exposed its 'secret' analytically was Alfred Lorenz. After a doctoral dissertation on form in the *Ring* (1922) and a study of the *Tristan* prelude (1922–3), he published the first of his four volumes of *Das Geheimnis der Form bei Richard Wagner* which were to analyse form in the *Ring* (1924), *Tristan* (1926), *Meistersinger* (1930) and *Parsifal* (1933). Lorenz's work was a landmark in the history of analysis. It was the largest-scale piece of sustainedly analytical writing so far. It used graphic and tabular techniques of presentation in a thorough-going way: the 'sine curve' for harmonic movement, the 'projectile curve' for extended formal contour, the graph for modulatory scheme (see fig.10 for the graph representing the whole

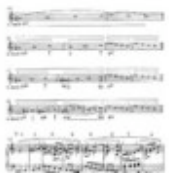
Ring cycle as a vast unified structure in D♭ major, with lateral spacing marking 40 pages of score and each horizontal line a major and space a minor key area) and type-set diagrams for more detailed tonal movement (see **fig.11** for the diagram of *Das Rheingold*, which is complementary to fig.15 and shows the opera as an introduction of 748 bars in the dominant of the dominant, followed by a massive symmetrical section of 3128 bars in D♭ pivoting round the relative minor, B♭).

Lorenz's work was the confluence of all the main developments in analysis before his time. It contained ideas from the Gestalt writers; his notion of periodization and symmetry derived from Riemann; his defining of structure drew on traditional *Formenlehre*; his perception of harmonic movement came from Kurth (to whom he dedicated his *Tristan* volume). It is also built from a large body of existing writings on Wagner's musical and dramatic structures (especially those by Hostinský, 1877; Grunsky, 1906, 1907; and von Ehrenfels, 1896, 1913) and on his leitmotifs (e.g. Mayrberger, 1881; von Wolzogen, 1876, 1880, 1882), and above all from Wagner's own prose writings.

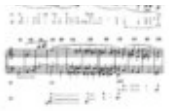
Lorenz saw formal construction (*Formbildung*) as created out of three primary things: harmony, rhythm and melody. He segmented the entire *Ring* cycle into periods according to key area (pp.23ff). He also analysed the distribution of leitmotifs into formal groupings: repetition forms, arch forms, refrain forms and bar forms. It is in this last area that his main contribution to music theory lies. Lorenz perceived a hierarchical structure in music, the two extremes of which are his *kleine Rhythmik* and *grosse Rhythmik*. The second of these arises out of the first by forms being 'raised to a higher power' (*potenzierte Formen*). By this process, three consecutive passages of music may each be constructed in arch form (*ABA*); the third of them may be a restatement of the first and so create an arch form at a higher level. The process may be traced at more than two levels. He also described the embedding of small-scale units within forms, extending them and changing the balance, and very large-scale forms that contain small-scale forms of different sorts. By analysing formal units in this way, Lorenz sought to uncover the architectonics (*grosse Architektonik*) of very large musical structures.

In 1906 Heinrich Schenker had published his *Harmonielehre*, the first volume of his highly influential *Neue musikalische Theorien und Phantasien*. Further volumes were *Kontrapunkt* (1910, 1922) and *Der freie Satz* (1935). Schenker's unique view of a musical composition was that works that are tonal and exhibit mastery are projections in time of a single element: the tonic triad. The projection of this triad comprises two processes: its transformation into a two-part 'fundamental structure' called the *Ursatz*, and the 'composing-out' (*Auskomponierung*), or elaboration, of the structure by one technique or more of 'prolongation'. The *Ursatz* is made up of a linear descent to the root of the triad – the 'fundamental line' (*Urlinie*) – accompanied by an 'arpeggiation' in the bass (*Bassbrechung*), from the tonic to the dominant and back to the tonic. In the simplest form of the *Ursatz* the linear descent begins with the 3rd of the tonic triad, and each note in it is accompanied by one chord in the bass. But this is a highly abstract notion, and in practice the elaboration begins with the structure in an already articulated form, representing the 'background' (*Hintergrund*) of the work.

This highly developed complex of ideas emerged over the last 30 years of Schenker's career. In his early *Harmonielehre* he had argued – citing passages from Fux, Beethoven, Chopin, Liszt and Wagner in support – that arrangements of notes that look on the surface like chords in their own right are not always essential steps (*Stufen*) in a harmonic progression, but are often merely expansions of other essential steps (see especially Eng. trans., pp.141ff, 155, 212). In this way Schenker established a distinction between 'triads' and 'steps' whereby not all of the former in a given tonal context rise to the rank of the latter. He began to represent harmonic progressions graphically on two levels (e.g. his ex.173/234), using in one instance a 'formula' to show short-term triadic movement over longer-term harmonic steps (p.244), in which I–V:I–V is shown as numerator and I as denominator. On the larger scale he saw the key areas to which a composition modulated as either 'established', in which case they funtioned as 'steps' at a higher level of form, or 'unestablished', in which case they served only to elaborate other key areas.



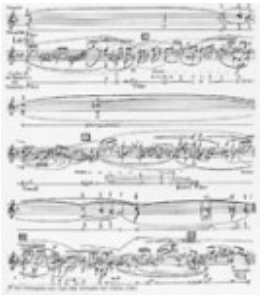
Another principle that emerged early in Schenker's development as a theorist was a view of composition as the elaboration of a basic contrapuntal design. In *Ein Beitrag zur Ornamentik* (1903) he had illustrated by reference to form in a sonata of C.P.E. Bach the idea of 'group construction' (*Gruppenbildung*): the diversifying of a single tonal unit of structure by thematic and motivic variety, by interior



From H. Schenker: 'Die letzten fünf Sonaten von Beethoven: Sonata…

harmonic movement, by variety of rhythmic placing and patterning, and by contrast of dynamic levels (pp.11ff). Schenker's scholarly activities – in particular his concern for authenticity in editing and performance, and his respect for the authority of autograph scores and authorized editions – had led him to this study of ornamentation in Bach, Haydn, Mozart, Beethoven and others. Its sigificance for his development as an analyst was that he was later to develop a technique of stripping away layers of ornamentation in the process of revealing the ultimate structure of a piece. In his 'Erläuterungsausgabe' of four of Beethoven's last five piano sonatas (1913–21 – that of op.106 did not appear because its autograph could not be found) he achieved a balance between the analytical and the textual sides of his work. In the last volume of the set, on op.101, he developed the idea of reduction by carrying it through successive stages. (Fig.12 shows the stages laid out one above the other.) Schenker intended this example as a tracing of the creative process step by step, not as an analysis; thus he spoke not of 'reduction' but of the reverse, *Diminution* (i.e. embellishment). Nonetheless, and although Schenker's final line (*a*) here does not take the form of his eventual *Urlinie*, the way in which the notes *e′ g′*♯*–a′–b*♭*′–a′ g*♯*′–a′* in the right hand of bars 1–4 are reduced to (*e′*)*–g*♯*′–a′ g*♯*′–a′* and ultimately to *g*♯*′–a′* shows the technique of his later analyses already formed.

In 1925 Schenker produced the first issue of a yearbook, *Das Meisterwerk in der Musik*, which was to run to only three issues (1925, 1926, 1930). It contained ten analytical studies, of works by J.S. Bach, Domenico Scarlatti, Beethoven and Chopin, accompanied by Schenker's new type of graphic analyses, together with a long essay on 'Die Kunst der Improvisation' (itself containing important analyses of keyboard works by C.P.E. Bach and Handel), a polemic on editorial practice, 'Weg mit dem Phrasierungsbogen' ('Away with the phrasing slur'), and a study-in-progress of the concept of *Urlinie*. This was not the first journal that Schenker had produced: he had published ten issues of *Der Tonwille* between 1921 and 1924. (Both journals contained material exclusively by Schenker.) An important analytical product of *Der Tonwille* was the study of Beethoven's Symphony no.5, produced in instalments and later issued separately (1925). The first two issues of the journal had contained preliminary studies of the *Urlinie* idea together with analyses using the so-called *Urlinie-Tafeln* – graphic analyses showing the fundamental line.

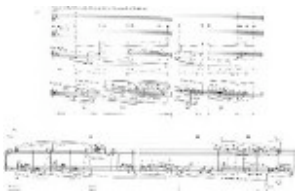


From H. Schenker: 'Das Meisterwerk in der Musik', i (Munich,…

The *Urlinie-Tafel* as developed at this stage was usually a presentation of a piece in full or partly reduced, with normal use of note values and complete with time signature and the original barring (numbered for reference). This was overlaid with auxiliary analytical symbols: horizontal and sloping square brackets over the staff to show the movement of the fundamental line; note heads printed large to indicate structural importance; curved lines like phrasing or bowing marks to indicate important progressions (often also labelled *Quintzug*, *Quartzug* etc.); dotted curves to indicate the longer-term structural retention of a particular pitch (or transfer to another octave) despite intervening pitches; and the fundamental harmonic steps (*Stufen*), symbolized below the staff by roman numerals, with conventional bass figuring to show the overlying harmonies. In some cases Schenker added a parallel staff above the *Urlinie-Tafel*: this carried his reduction of the piece to bare harmonic essentials – already termed *Ursatz* – and partly abandoned the durational significance of note symbols in favour of a valuation whereby greater duration denoted greater structural importance. Fig.13 illustrates all these features and many others (the *Urlinie-Tafel* showing the Largo from Bach's Violin Sonata no.3 BWV1005 bar-for-bar but in skeletal form): bar 7, and bar 17 a 5th lower, show how the fundamental line (*f″–e″–d″*) moves from the top line of the texture to the bottom and back, and how the last of its notes is not actually sounded but only implied (hence the parentheses). For this particular piece, Schenker chose also to give a three-layer graph (fig.14) of which the bottom layer is a partly reduced form of the piece, the middle one an intermediate stage of reduction, and the top one a complete reduction corresponding to the upper parallel staff of the *Urlinie-Tafel*. These two graphs are accompanied by 11 pages of closely reasoned text with further music examples.

The main achievements of the yearbook were a long and lucid essay on Mozart's Symphony no.40 in G minor (vol.ii) and the massive analysis of Beethoven's 'Eroica' Symphony (vol.iii). In these analyses the layers (*Schichten*) are identified as 'foreground', 'middleground' and 'background'; horizontal brackets are abandoned in preference to the beaming together of structural notes, and many other graphic devices are adopted.

Such was the sophistication of Schenker's graphs during the last five years of his life that he was able to discard verbal commentary altogether. His *Fünf Urlinie-Tafeln* (1932) are self-sufficient graphings of works by Bach, Haydn and Chopin. By this time the *Ursatz* had taken its final form as a two-part counterpoint that accomplished what Schenker saw as lying at the heart of his theory – a projection of the triad into the dimension of time. Its upper voice, the *Urlinie*, was a melodic progression originating from a note of the triad and descending scalewise to the tonic (3–2–1, extensible to 5–4–3–2–1, or rarely 8–7–6–5–4–3–2–1); its lower voice, the *Bassbrechung*, was an 'arpeggiation' from the tonic note to the dominant and back again. This meant that the basic structure of any tonal piece of music was diatonic, and all modulations were considered as 'prolongations' of diatonic harmonic steps.

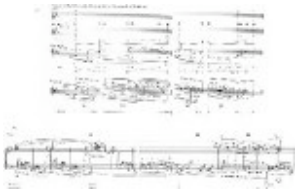


From H. Schenker: 'Fünf Urlinie-Tafeln' (Vienna, 1932; from Eng. trans.,…

Fig.15 shows the background and middleground (the *Ursatz* and three further layers) of Schenker's analysis of Chopin's Etude in C minor op.10 no.12, as published in *Fünf Urlinie-Tafeln*. Each of these layers is set out on a single staff and makes use of notational symbols (though with unconventional meanings), together with slurs, brackets and parentheses. The layers are aligned vertically, so that any element of the composition can be traced back to its conceptual origin in the *Ursatz*. Roman numerals are used for harmonic steps (from I to VII), capped arabic numerals for melodic degrees of the scale (1□, 2□, 3□ etc.), ordinary arabic numerals for bar numbers and bass figuring; words and auxiliary symbols are also used.

The first layer shows an articulation of the *Ursatz* into two parts: the first and second elements are presented before the statement is broken off; it is then recommenced and concluded. This transformation is known as 'interruption' (*Unterbrechung*), and the point of breaking off is marked by the word *Teiler* ('divider' – often indicated by two short vertical lines just above the staff). In layer 2 this interruption is multiplied to three occurrences.

In layers 2 and 3 void noteheads are used to indicate notes of greater structural importance, black noteheads notes of less. The void noteheads are linked together by large beams, pointing up the fundamental two-part form of the composition. Black noteheads are linked together by slur marks, which pick out detailed melodic progressions, and these progressions are often labelled verbally (e.g. *Terzzug abwärts*, '3rd-progression downwards', *Sext-Brechung-aufwärts*, 'arpeggiation through a 6th upwards'). They are also linked by beams to void notes. Dotted slur marks indicate not progression but recurrence of a structural note after the intervention of other notes (thus the recurrence of *d″* in the first half of layer 2). Black notes with tails (quaver symbols) are used to point up small-scale events of special interest (such as the neighbour-note patterns *g′–f♯′–g′* and *b♮″–c‴* in layer 3).



From H. Schenker: 'Fünf Urlinie-Tafeln' (Vienna, 1932; from Eng. trans.,…

The 'foreground' (a term synonymous with *Urlinie-Tafel* in this publication) contains the elements of the contrapuntal design that are immediately perceptible, eliminating only ornamentation and note repetition from the surface of the work. In this analysis it is presented separately, occupying far more lateral space than the other layers and thus not aligned with them (**fig.15*b***, showing only bars 1–18). The harmonic indications at the bottom of **fig.15*b*** show that what is considered as I–IV–V in the foreground becomes entirely I in the middleground. Moreover, Schenker's analytical method completely rejects the conventional idea of modulation: key changes are viewed as harmonic elaborations of diatonic harmonies. Thus the moves to B♭ minor, D♯ minor, C♯ minor and F minor around bar 30 of the étude are seen ultimately as prolongations of C minor harmony.

The fullest statement of Schenker's approach was his posthumously published *Der freie Satz*, but the scope of his thought cannot be understood from this treatise alone. His analyses were designed primarily for the performer and were always pedagogical in funtion. They encouraged a new way of hearing music – long-range listening – and, by the time of his final graphic method, attempted to lead the reader stage by stage from the familiar text of a work through to an understanding of it as a complex organic whole.

In 1932 Schoenberg wrote: 'For nearly 20 years I have been collecting material, ideas and sketches, for an all-inclusive textbook of composition'. The project was never completed, and might best be regarded as a work-in-progress that Schoenberg was never likely to relinquish. (His early

Harmonielehre, 1911, was brought to a conclusion only by dictation with the help of a stenographer.) But such was the importance of Schoenberg's musical thought in the history of 20th-century composition that even in fragmentary form, edited by Severine Neff and others as *Zusammenhang*, *Kontrapunkt*, *Instrumentation*, *Formenlehre* (Eng. trans., 1994) and *Der musikalische Gedanke und die Logik, Technik und Kunst seiner Darstellung* (Eng. trans., 1995), these writings seemed likely to exert a considerable influence on analysis – particularly on analysis of his own music and that of his pupils. The *Harmonielehre* too is of significant interest to analysts as a source of ideas applicable to music composed by Schoenberg, Berg and Webern in their early careers; Schoenberg's essays, a number of them on technical subjects (twice collected under the title *Style and Idea*, 1950, 1975), have also been used in this way.

This is symptomatic of a tendency for analysis of modern music to use approaches 'authenticated' by more or less direct association with the composer in question. Other examples include Hindemith, whose writings are discussed below, Messiaen, Babbitt, Xenakis, Boulez and Stockhausen: the music of all these can be analysed with ready citation of their own technical writings. Three factors that can be identified behind the growth of this phenomenon are: the difficulties of lay comprehension of modern styles, the function of analysis as elucidation that had been established by around 1910, and the propensity of composers to write about their own music in ways that were newly amenable to appropriation by analysts – historians and critics having long used such sources for their own purposes. In some cases composers also wrote more generally conceived theoretical or analytical texts, though no major composer of the 20th century, not even Schoenberg, has approached Rameau in status as a music theorist.

Schoenberg must indeed be reckoned eclectic and somewhat conservative as a theorist; but he wrote from conviction in trying to set out at least some of the impulses that drove him as a composer. It is ironic, then, that he was comparatively reticent about his most notable compositional innovation – 12-note serial technique – and about the particulars of his preceding atonal style. Seeing his own music as a continuation of the Austro-German tradition, he chose instead to write about broader topics in a way that adhered to the 19th-century view of music as organic. Construction thus begins with the motif, the motif must by its nature be repeated, repetition requires variation. But in Schoenberg's view the comprehensibility of musical form implied more than the aspect of subdivision which enables the mind to grasp the whole through units: it also implied logic and coherence, without which such units remain disconnected. It was on these latter questions that he was at his most original. By the mid-1920s his instinct for unity and intellectual synthesis had led him to the principle of the musical Idea (*Gedanke*) as the foundation of all aspects of a work, including form, counterpoint and the presentation of material. This notion of the Idea remained difficult to grasp – it seems intended to give concrete expression to an organic-psychological image of the seed of creative thought, but also not to be identified consistently with a specific type of musical feature – and analysts were likely to conclude that Schoenberg had not helped them to address the question of where, in any particular work, one might look for the Idea itself.

Nonetheless, a number of concepts that emerged in Schoenberg's teaching and writings as he worked towards this position were taken up by others and used fruitfully in analysis. Among these was 'liquidation', whereby a melodic unit gradually loses its characteristic features until only a residue remains. Schoenberg's concept of 'developing variation' (*entwickelnde Variation*) was applied by Walter Frisch (1984) to the music of Brahms – whose innovations in musical language had been a lifelong preoccupation of Schoenberg. Developing variation was the principle whereby the structural ingredients of themes (motifs, phrases) were reiterated only in varied forms, with their internal elements (intervals, rhythms, harmony, contour) undergoing modifications at each restatement. Schoenberg's more rarely used 'basic shape' (*Grundgestalt*) was taken up by David Epstein (1979) in seeking a synthesis of Schenkerian and Schoenbergian ideas (*see also* **GRUNDGESTALT**).

From A. Schoenberg: 'Fundamentals of Musical Composition' (London, 1967), 11

Compared with the ambition of his earlier writings, the pedagogical texts dating from Schoenberg's American years are deliberately limited in scope. Of these, only *Models for Beginners in Composition* (1942) was issued in his lifetime; *Structural Functions of Harmony* (1954) appeared shortly after his death. Later, two sets of notes from the late 1930s, designed for teaching purposes, were assembled and published: *Preliminary Exercises in Counterpoint* (1963, dating from *c*1936) and *Fundamentals of Musical Composition* (1967, dating from between 1937 and 1948). The latter is a small manual of form; though intended for composers, it rests on analytical exemplification and is to some extent a manual of analysis, drawing particularly on examples from Beethoven's piano sonatas. The most influential aspect of

the book, as disseminated earlier through his teaching, is his atomic splitting of the motif into 'element' or 'feature'. The 'element' is often a single interval underlying a pattern of notes, and itself undergoes repetition, transposition, inversion, internal multiplication, enlargement, contraction and all the other processes to which the motif is subject. His reduction of the first theme of Brahms's Symphony no.4 to a succession of 3rds is perhaps the most famous example in the book (**fig.16**).

In his *Unterweisung im Tonsatz* of 1937, another composer, Hindemith, believed himself to have laid down the basis of a *lingua franca* for modern composition, 'proceeding from the firm foundation of the laws of nature'. Like Schenker, Hindemith believed in the force of tonality and the primacy of the triad; but his theory is far more systematically acoustical. To Hindemith, if any one of the notes of the chromatic octave scale be taken, then the other 11 notes can be ranged in descending order of relationship to it. This order he called 'Series 1'. Adopting the principle of inversion (by which, for example, minor 7th = major 2nd), he determined an order for intervals based on combination-tone curves in increasing complexity. This produced 'Series 2', of intervals in descending order of value with respect to a given note. This series acknowledges no point at which consonance ends and dissonance begins. From this Hindemith developed a system of chordal analysis, which first allocates to any chord a root – always present in the chord, unlike the roots of Rameau's harmonic system – and then measures the intensity of that chord. Hindemith classified chords containing three to six notes into separate groups and subgroups in terms of their harmonic intensity. Using these groups, a composer might put together a succession of chords in whatever 'harmonic crescendo and decrescendo' he wished. Such an increase and decrease of intensity he called a 'harmonic fluctuation' (a concept closely related to Kurth's idea of *Spannung*); and he devised a graphic means of demonstrating this beneath the staff. Hindemith proceeded from there to determine harmonic relationships on a larger scale by measuring the progression of prevailing roots, the 'degree-progression', against Series 1.

Although *Unterweisung im Tonsatz* was intended as a constructional tool for composers, and stressed the realms of harmony that Hindemith felt were not adequately covered by conventional harmonic theory, its theories were meant to apply equally to the harmony of the past and thus to function as a means of interpreting and analysing the music of any period. (In all this it differed significantly from a treatise such as Messiaen's, 1944, which was concerned solely to explain his own music.) Hindemith supplied, at the end of the first volume, a set of analyses of music ranging from plainchant to music by himself and Schoenberg. As an analytical method his system is like Schenker's in being based on a theory of melody and harmony with no separate theory of rhythm. It is unlike it in that there are no structural levels: all notes at the surface can be related to the tonal centre, and modulation is an accepted tonal procedure which is not reduced out of existence.

Between 1935 and 1939 the programme notes that Donald Francis Tovey had been writing for the Reid Concert Series in Edinburgh since the mid-1910s (though some go back to 1902) were published together in six volumes, reminiscent of Kretzschmar's *Führer durch den Konzertsaal*. The material was arranged by genre, and within that in chronological order, the final volume containing supplementary essays and a glossary. As a whole, the volumes made a substantial analysis book of the 18th- and 19th-century orchestral and choral repertory. To this Tovey added in 1944 a further volume on chamber music (some of whose essays go back to 1900) and a set of analyses of Beethoven's piano sonatas (1948). These books, and his articles for the *Encyclopaedia Britannica* written between 1906 and 1910, were a strong influence on subsequent British analytical and critical writing. They are notable for their pungent prose and avoidance of dogma. They are true examples of English empiricism, rejecting the analyst's formal models as 'nonsensical', and equally rejecting the idea of organic unity as '*a priori* fancies'. All such theories were 'fallacies' (1948, pp.298, 3, 8ff). Even the terms 'first subject' and 'second subject' were discarded: the latter had 'worked … havoc in our notions of sonata form and sonata themes' (1935, p.2); and 'binary' and 'ternary' 'not only miss the essential grounds of classification, but are thoroughly misleading in all that they imply'. He deprecated any terminology that 'assumes a map-like or space-like view of music instead of a time-like view' (1935, pp.10ff).

Tovey saw himself as dealing only with the 'facts'. It was the successive aspect of description that was most important to him, since he saw analysis as tracing the same process in time that the 'naive listener' experienced. He thus proceeded 'bar-by-bar', 'phrase-by-phrase'; he called this method 'précis-writing', and attributed it to Hubert Parry. It is a judicious mixture of descriptive, naturalistic writing and technical information, illustrated with frequent musical examples and allocating letter-symbols to figures and themes. But here again Tovey was critical of others: 'we shall do well to beware of the exclusively subjective methods of criticism … which may be but mildly caricatured as consisting in sitting in front of a work of art, feeling our pulses, and noting our symptoms'.

Tovey's method was a blend of the hermeneutic and the formalistic which implicitly stated that there are things in music beyond explanation. At the same time he was always concerned with audibility – perceptibility without recourse to orthodoxy. If a feature was not observable by the innocent ear of the non-expert hearer, then it was not worth observing. The 'naive listener already possesses the right musical sensations. These are as direct as the colours of a sunset or the tastes of a dinner. Connoisseurship comes from experience, not from verbal explanations' (1949, p.271). However, that Tovey dissented from the abstract theory of his age is not to be taken as signifying radically forward-looking thought. His idealized reader is not so very far from the amateur music-lover who was the addressee of much mid-19th-century analysis. It is clear that the 'naive listener' and Tovey's dislike of theorizing are counterparts within a single approach.

Tovey had little impact in continental Europe or the USA, but after 1970 underwent a revaluation among certain American scholars, notably Charles Rosen (1971, 1980) and Joseph Kerman (1975–6, 1985). For the latter, in his championing of a species of musicology that fuses the objectivity of the historian with the personal experience of the critic, Tovey was to become in some measure prototypical.

5. 1945–70.

In the years after World War II two highly influential lines of intellectual thought came to impinge on musical theory. To some extent both were approaches to phenomena – methodologies – rather than fields of study in their own right. The first was linguistics, founded as a modern science by Ferdinand de Saussure about the turn of the 20th century; this began to influence musical theory in the 1930s and 40s before making a great impact in the 50s and 60s in conjunction with the closely related approaches of structuralism and semiology. The second was cybernetics and information theory, which as mechanistic views of the world began life at the end of the 40s with the work of Norbert Wiener (*Cybernetics*, 1948), and Claude Shannon and Warren Weaver (*The Mathematical Theory of Communication*, 1949).

Linguistics examines social communication through natural language, seeking to uncover the rules by which a given language operates, the deeper rules by which language as a general phenomenon operates, and the processes by which individuals intuitively learn the complex rules of their own language. It took important strides forward with the work of three circles of linguistics scholars: that in Prague, including Roman Jakobson and N.S. Trubetzkoy; that in Copenhagen, including Louis Hjelmslev; and that of American scholars including Zellig Harris and Noam Chomsky. The kindred approaches of semiology and structuralism both tend to reduce all kinds of non-linguistic social communication to the state of natural language, semiology by treating all the ways in which human beings signal to each other (by the clothes they wear, the gestures they make, the food they eat and so on) as 'codes' containing 'messages' which can be encoded and decoded by those familiar with that code, structuralism by seeing all social phenomena as 'wholes' (or 'structures') whose elements are governed by well-defined laws (*See* **SEMIOTICS** and **STRUCTURALISM AND POST-STRUCTURALISM**).

Cybernetics sees all activities, human, animal and machine, in terms of control systems. Thus the nervous system of a human and the electronic system of a computer and the servo system of a complex machine plant are seen as analogous processes, with inputs and outputs, with information feeding back to modify the operation of the system, and so forth. Information theory measures the capacity of systems to receive, process, store and transmit information. Information is thought of as a choice of one message from a set of possible messages; some messages come more frequently than others, thus setting up different probabilities for the arrival of any one message. Information theory reduces any existing range of choices to a network of two-way or 'binary' choices. When a highly probable choice is presented within a message, that choice is said to contain 'low information'; and conversely when an unlikely choice is presented then that choice contains 'high information'. In other words, information is generated by non-confirmation of expectation. Information theory spread rapidly in the early 1950s to fields of application as widely differing as genetics, neuro-physiology, sociology and philosophy, and soon to aesthetics, where it came upon certain difficulties. For in the arts what information theory calls 'redundancy' (namely, confirmation of expectation, non-information) plays a special role in creating form and structure.

The first musical contribution in either of the new fields of thought was probably an address to the first International Congress of Phonetic Sciences in Amsterdam as early as 1932 by the

musicologist, style analyst and ethnomusicologist Gustav Becking (see §4 above). It was phonology (the science of distinguishing between elements in a stream of vocal linguistic sound and the apprehension of the rules by which these sounds are linked together), as developed by Trubetzkoy, that seemed relevant to music. And in particular it was the scholars of non-Western music, with their rapidly developing scientific approach to their material, who first saw its relevance. Becking, in discussing Serbo-Croat popular epic, pointed to a certain parallel between basic problems in phonology and those in musicology, illustrating this by the different constructions that people of different world cultures place on a given single musical sound. Such people operate within different musical systems, and Becking tried to set up a typology of systems, 'unidimensional', 'bidimensional', 'tridimensional' and 'quadridimensional'. The great linguistics scholar Roman Jakobson took up Becking's point in the same year, stressing that the particular property of music, as of poetry, is that its conventions are wholly phonological in operation, and do not concern etymology or vocabulary. He urged musical analysts to study the model of phonology.

13 years later Milos Weingart explored the analogies between musical and language phrase structure, with reference to Czech, and in 1949 Antonín Sychra examined folksong by means of linguistic method. Further significant developments in the linguistic analysis of music included a brief proposal by Bruno Nettl (1958) and the first contribution by an influential figure in this field, Nicolas Ruwet, in which he sought to define the aural problems of listening to integral serial music by reference to phonology and the need for a 'margin of error' between the phonemes in a phonemic system (1959). Discussions of the application of information theory appeared by such writers as Bean (1961), Meyer-Eppler (1962), Hiller (1964), Winkel (1964) and Brincker (1970).

In 1956, in a volume of essays dedicated to Jakobson, George P. Springer provided a comparison of language and music that surveyed the progress of linguistic analysis in music. Springer discussed the distinction between repetition (i.e. identity) and difference as a binary opposition, and the modification that the idea of variation brings to this, concluding that music (1956, p.510):

> "is subject to conventional rules of combination and distribution, and *ipso facto*, of probability. … Moreover, music turns out to be not only a stochastic process (producing a 'sequence of symbols … according to certain probabilities') but the special kind of stochastic process known as the Markov chain (where 'probabilities depend on previous events')."

Springer's description summarizes the basic principle of information-theory analysis, which views music as a linear process (*see* **INFORMATION THEORY**). The process is governed by a syntax, but the syntax is stated in terms of the probability that any one element will occur next in the line rather than in terms of grammatical laws. Music is treated by analogy with the transmission of a message from sender to receiver, but neither that nor the word 'information' should give the impression that meaning and communication are taken in the hermeneutic sense. A message is a chain of discrete sense-units, which in music are taken to be 'events' in a composition: usually isolated notes, chords or simultaneities. Any one event in the chain arouses a prediction of its following event. If the prediction is confirmed then no information is imparted; if it is 'non-confirmed' then information is imparted. But events in music form patterns, and the total amount of information contained in a pattern can be calculated by a formula and expressed as an 'index'.

As early as 1956 R.C. Pinkerton and Abraham Moles produced articles relating information theory, as presented by Shannon and Weaver, to music, and in 1958 and 1959 a spate of material was issued on the subject: two basic presentations by David Kraehenbuehl and Edgar Coons, an article by Joseph Youngblood, a monograph by W. Fucks, and an extended book on the broader application of the theory to aesthetic perception by Moles that devotes a chapter to perception of 'sonic material'. Coons and Kraehenbuehl (1958) offered two indices, one of articulateness, which they described as measuring 'how neatly the conditions of "unity" and "variety" have been arranged so that the force of neither is dulled', and one of hierarchy, which measured 'how successfully a "variety" of events has been arranged to leave an impression of "unit"' (p.150). Their method, in other words, measured the phenomena of unity and variety, which are so important in analysis, in an objective and tangible way rather than a subjective and vague way. It could do this for a single structure, or for a work with respect to the known terms of reference of that work's style.

In his first important book (1956) the aesthetician Leonard B. Meyer came close to information theory in his view of styles as culturally conditioned systems of expectations, and of musical meaning as deriving from the arousal, frustration and fulfilment of such expectations. Meyer was

still working within the Gestalt concepts of *Prägnanz* and closure. In the following year, however, he introduced the fundamentals of information theory into his argument and revised his definition of 'meaning' in music, fashioning three stages of what he called 'embodied meaning': the 'hypothetical meaning' before a sound-pattern has been heard, the 'evident meaning' when the sound-pattern has become a concrete event, which initiates a stage of 'revaluation' comparable with 'feedback' in control systems, and the 'determinate meaning' that arises later in the total experience. Meyer dealt, as Moles had previously done, with the concept of 'noise' whereby information is distorted. The maturity of Meyer's thought is shown in his subsequent essay (1961), which subjected the view of music as information to the actual situation of music frequently reheard.

The use of the computer in musical analysis may be traced from 1949, when Bernard Bronson, editor of the melodies of the Childe ballads, analysed range, metre, modality, phrase structure, refrain pattern, melodic outline, anacrusis, cadence and final of folksongs, using data on punched cards. The measuring of such quantities and the production of sets of statistics was the facility most readily available from early computers. There was no essential difference between a human doing these operations by hand and a computer carrying them out electronically, but the computer had the advantages of speed, accuracy and exact memory. Software systems with biases towards the demands of musical material were created in the early 1960s. An important article by Selleck and Bakeman (1965) explained two strategies for analysing melodic structures: one through probabilities, which derived from information theory, the other through comparing and sorting melodic units, which derived from linguistics. The journal *Computers and the Humanities* (1966–) maintained a director of projects in progress, enabling scholars to be aware of other work in their field and encouraging collaboration. A collection of essays on electronic data processing in music, published under the editorship of Heckmann (1967), presented a cross-section of work, including 'languages' for representing music, strategies of computational analysis, sample analyses and articles raising more general issues.

The most significant study of mathematics and music at this time was Xenakis's treatise *Musiques formelles* (1963). Although his exposition of probabilities, stochastics, Markov chains and the theory of games resorts to analysis mostly in order to trace the compositional means in his own works, the framework that Xenakis set out places the art of music on a more universal plane, opening it up to investigation according to precise laws. Pouring scorn on existing cybernetic and linguistic analyses of music as elementary and pseudo-objective, he proposed 'a world of sound-masses, vast groups of sound-events, clouds, and galaxies governed by new characteristics such as density, degree of order, and rate of change' in place of traditional 'linear' musical thought. Pierre Schaeffer's *Traité des objets musicaux* (1966) was a dissertation on the sonorous material from which music is made: an attempt to present a full typology of that material, and to discover its general laws. Schaeffer's treatise is underpinned with acoustics and with philosophy and is centred on 'l'expérience musicale'; but it is much more tangible in its formulation of a 'solfège des objets musicaux' which is in practice a system of classification by seven criteria: mass, dynamic, harmonic timbre, melodic profile, mass profile, grain and inflection (*allure*).

The postwar years were a period of revival, development and dissemination for the teachings of Schenker. Much of this was undertaken by former pupils of his who had emigrated to the USA. A Schenkerian tradition of teaching was established at the Mannes College of Music in New York, and knowledge of Schenkerian approaches was widened through the publication of important books by Adele Katz (1945) and Felix Salzer (1952). Although Schenker's most active pupils (and their pupils in turn) remained devoted to his insight, many of them had original ideas to contribute to the developing tradition. As Schenker's own writings remained largely unavailable in English translation, however, it was not always evident other than to specialists that Salzer's *Structural Hearing* in particular contained significant departures from Schenker's views on the nature of music and significant developments of his analytical techniques, notably in their application to early music and 20th-century music. In the process of gradual assimilation alongside other contemporary developments in analysis, Schenker's organicist language was to a large extent replaced by words that expressed musical relationships in terms of structure. The result, far from diminishing the impact of Schenker's ideas, served to establish him as a decisive influence. While it was left to later generations to re-examine Schenker's original writings in the context of the history of ideas, there was a new flourishing of practical analyses either along directly post-Schenkerian lines or significantly influenced by Schenkerian thought (e.g. Forte, 1955).

Schenkerian analytical work continued in strength during the 1960s, and an occasional publication under the title *Music Forum* was founded by Salzer and William J. Mitchell in 1967 to present extended analyses of which some in each issue would use Schenkerian techniques. The series had particular value because of the attempts made in it to extend Schenker's techniques to music

outside the domain for which it was created: to medieval and Renaissance music (Salzer, 1967 and Bergquist, 1967) and to contemporary music. Among the non-Schenkerian material in *Music Forum* is Lewis Lockwood's masterly study of the autograph of Beethoven's Cello Sonata op.69, a rare blend of rigorous historical musicology and analytical method (1970).

During the first postwar decades a new approach to organic motivic analysis was being forged, which influenced analytical writing in Britain but found little sympathy elsewhere in Europe or in the USA. It was first expounded by Rudolph Réti in two books (1951, 1958), of which the earlier, *The Thematic Process in Music*, is his classic exposition. But before that, Réti, who had lived in Vienna most of his life until emigrating to the USA in the 1930s, had worked intensively on analyses of sonatas by Beethoven between 1944 and 1948 in an attempt to grasp Beethoven's compositional process. These analyses were published in 1967, ten years after his death.

Réti started from the two-dimensional view of formal construction that was implied in Schoenberg's *Fundamentals*: motivic expansion, and division and demarcation. Réti reconciled these two dimensions. His method in itself produces, by reduction of all the thematic material of a work to its abiding common elements, a series of 'cells' underlying the work's motivic material. These are small-scale melodic contours comprising two or three intervals and in origin non-rhythmic. Each cell can undergo transposition and inversion. Réti saw specific sequences of such cells recurring as a 'thematic pattern' in each of the movements of a large-scale work, and creating a symmetry or unity between movements which he considered a conscious act of composition. Such a pattern supplies its own natural thematic grouping which, in Beethoven's work, often takes the place of strict textbook form, becoming 'the skeleton of all themes in all movements; it determines the modulations, the figurations and the bridges, and above all, it provides an outline for the overall architecture' (1967, p.94). Thus the two prime cells of the 'Pathétique' Sonata of Beethoven are as shown in fig.23*a* [not available online]; Réti has given them separate functions by designating them 'prime cell' and 'concluding motiv' respectively. Fig.23*b* [not available online] shows where the cells are located in the opening bars of the first movement. The motifs (still without rhythm) which can be derived from these cells may be set out in a table. An entire movement can then be set out, in non-rhythmic form with its melodic shapes grouped to reveal the motif forms, as a 'thematic song'.

The Thematic Process in Music extended these ideas, expressing more fully Réti's view of music as a linear compositional process. The composer starts not with a theoretical scheme but with a motif that has arisen in his mind, which he allows to grow by constant transformation – by transposition, inversion, reiteration, paraphrase, variation. Its growth is evolutionary. In time he makes a significant modification to the motif or picks up a detail from his elaborative material, and this becomes the focus. A work is thus seen as 'a musical improvisation … around a few motifs'. The book also dealt with key relationships, presenting a diversity of examples and attempting a historical survey of the thematic process. His second book, *Tonality, Atonality, Pantonality*, expounded what he saw as a new kind of tonality 'which does not appear on the surface but is created by the ear singling out hidden relationships between various points of a melodic or contrapuntal web' (p.65). At the heart of this idea was the 'moving tonic'. Réti supplied a wide range of contemporary analytical examples in support of his thesis.

Two years before this last book of Réti, Hans Keller presented the first of a succession of short, pithy articles in which he put forward the principles of 'functional analysis'. 'Functional analysis postulates that contrasts are but different aspects of a single basic idea, a background unity' (1956–7, p.15). Keller saw his analytical work as the purely objective isolating of background unities, and strongly refuted charges of subjectivity. Criticizing Toveyan analysis as 'anatomical', and thus concerned with 'dissection', he proposed a method that would attempt 'to elucidate the unifying *functions* of the living organism that is a musical work of art' (***MR***, xviii, 1957, p.203). Whereas Réti's view of music was as a single process passing from beginning to end, Keller saw music as a double process: a linear development – argument would be a better word, for Keller's view was that music communicates and that the listener 'understands' it – but one that is controlled by a single cell-like 'basic idea'.

The singularity of the basic idea introduces an element of projection into the compositional process. Keller spoke of musical thought as two-dimensional: that is, as having both a 'foreground' and a 'suppressed background', the latter too obvious to be stated by the composer yet vitally important for the analyst to reconstruct in order that the unity of what followed might be demonstrated. The background proceeds by the law of identity, the foreground by the law of contradiction. Thus music has the quality, not open to logical thought, that something may both be and not be something. In context, Keller's view of a piece of music (a piece, as with Schenker, that exhibits mastery) is of unity within diversity: of constant 'latent' presence of a single basic idea, articulated in time as a

succession of 'manifest' contrasts on the surface of the music. To identify the pervasive, all-embracing idea is the first task of the analyst. All the principal thematic material must be brought together, and by reduction the highest common factor within that material must be isolated – a small-scale idea, a germ-cell, whose internal elements are reproduced at the surface in close proximity, and which recurs again and again. The second task is to account for the continuity of the foreground. This involves not only explaining how each manifestation of the basic idea is derived from the original but also why that particular derivation occurs at that point. Analysis elucidates the funtions of a piece as if it were a living organism. As with Réti, the basic idea is usually a melodic outline, a succession of intervals out of time. Its manifestation is thus a rhythmicization. The foreground derivations may involve transposition, inversion, retrogression or 'interversion' (the reordering of the elements of the idea). Keller, however, was less open than Réti to the criticism of neglecting rhythmic aspects of a structure, for his method recognized fundamental rhythmic patterns, and thus augmentation and diminution are further types of derivation. Also very important in foreground continuity were the separation of two phrases latently in antecedent–consequent relationship – called 'postponed complementation' by Keller – and the reversing of the order of two such phrases.

Early presentation of functional analysis was by verbal text with music examples. Such examples showed thematic material with labelled motifs and derhythmicized reductions. In 1957 Keller took an even bolder step than Schenker had when abandoning the word for the graph: Keller abandoned word and graph for sound, by preparing an analytical score which demonstrated what he saw as the background unities of Mozart's String Quartet in D minor κ421/417*b* entirely in musical sound. Keller's method involved composing a score, for the same forces as the work under analysis, in which passages of the original are interspersed with aural demonstrations of the links between themes. He claimed for this the advantages that it avoided the transition between musical and verbal thought, that the through-composition of the analytical score led along purely musical lines, and that the subjectiveness of verbal description was eliminated. Several such analyses were prepared and broadcast in Britain and on the Continent, but none of Keller's scores was published until much later (1985, 1995).

The work of Réti and Keller was furthered in the 1960s through two books by Alan Walker. In the first of these (1962) he argued for the validity of mirror forms, and introduced the Freudian elements of repression and preconscious association into the theory of motivic unity. Walker's second book, on musical criticism (1966), offers much analytical material, demonstrating the 'all-pervading background forces' that operate in musical creation, and furthering the Freudian theory. The book contains a useful exposition of 'historical background', a concept fundamental to Keller's work. A different association of motivic analysis and psychology lay behind Robert Donington's Jungian interpretation of Wagner's *Ring* (1963).

There was a revival of hermeneutic theory in *The Language of Music* by Deryck Cooke (1959), which argued for the materials of music as a quite specific vocabulary of intervallic contours with the connotations of emotional states. Cooke argued that these connotations arise not by convention but from the inherent forces of the intervals that make up the contours: forces of tension and direction. His analyses were thus apparently based on natural phenomena, translating a musical expression of psychological states and events (presumably those of the composer) into a verbal expression. Cooke's presentation of tonal intervallic patterns as underlying formulae that were deployed across a wide range of musical styles was independent of Albert B. Lord's study (1960) of Yugoslav epic, which proceeded from the concept of oral composition originated by the classical scholar Milman Parry (1902–35; see *The Making of Homeric Verse*, 1971). Lord investigated the mechanism by which a singer spontaneously creates or recreates a song through the 'theme' and the 'formula', and in particular through the capacity of formulae to group into 'systems' which provide the singer with alternatives to match different metrical situations in the poetry that he is creating. This idea, though scarcely applied to music by Lord, was taken up by Leo Treitler (1974) for the analysis of plainchant.

Towards the end of the period there was much interest in style analysis, as shown in Richard Crocker's *A History of Musical Style* (1966), Alan Lomax's discussion of 'cantometrics' (1968) and Jan LaRue's *Guidelines for Style Analysis* (1970). The last two studies are examples of category analysis, a method that starts with the recognition that music is too complex a phenomenon to be comprehended without some way of breaking down its material into elements – not so much its temporal elements (phrase, motif etc.), though these may be part of the 'breaking-down' process – as those facets that are constantly present: the 'parameters'. What the analyst requires is, in LaRue's words, 'a set of categories that are satisfactorily distinct, yet without undue branching and proliferation' (1970, p.10). Each category is then given a scale of measurement, and it is this

measuring that is the critical operation in the analysis. Construction and cohesion are but two of the terms of reference, along with techniques of instrumentation and vocal writing, usages of consonance and dissonance, of metre and rhythm, of texture and such like, which characterize a style or repertory. LaRue's system was designed with the 18th-century instrumental repertory in mind, and Lomax's for singing style in the folk music of word cultures.

In abstract, category analysis establishes a two-dimensional grid, a 'matrix', one dimension comprising categories, the other the scale of measurement. Lomax's 'behavioral grid' is made up of 37 categories and 13 degrees. It operates on a single level, ultimately locating any singing style somewhere along a spectrum of style whose extremes are 'highly individualized and group-dominating performance' and 'highly cohesive, group-involving performance' (p.16). LaRue's system has only five categories (four 'contributing elements' and a fifth 'combining element') and three degrees (the Aristotelian 'rule of three': two extremes and a mean). In practice, however, the system contains hierarchies and is consequently much more complex to operate. The five categories are: Sound, Harmony, Melody, Rhythm and Growth. But sound is subdivided into 'Timbre', 'Dynamics', 'Texture and Fabric'; harmony into 'Color' and 'Tension'; melody into 'Range', 'Motion', 'Patterns' and so on. Each subcategory has its own set of degrees of measurement: thus melodic patterns are measured as Rising, Falling, Level, Waveform, Sawtooth or Undulating; and the number of degrees varies from subcategory to subcategory. Moreover, each category is considered at each of three levels of magnification (LaRue's 'dimensions': Large, Middle and Small). The resulting analytical grid is really three-dimensional, with categories and subcategories as one dimension, the three levels of structure as the second, and the variable degrees of measurement as the third. However, a finished analysis is displayed as a table, with categories as rows and dimensions as columns: each box in the table contains (if relevant) a verbal description that does not limit itself to quantification but also supplies information about context and function. LaRue stressed the need for large sampling of any given repertory as a frame of reference for judging distinctiveness, and appended to his analytical system a method of extracting the essential and relevant information from analyses of individual works so that comparative analysis may be performed without drowning in data.

6. Since 1970.

The period after 1970 saw analysis emerge as a recognized discipline within musical studies, comprising a number of approaches and methods. This was reflected in a spate of new journals, some of them edited by graduate students in America, and in the formation of new societies of music theory. *Theory and Practice*, the organ of two student societies in New York State, began in 1975; so too did *In Theory Only*, journal of the Michigan Music Theory Society; and *Indiana Theory Review* followed them in 1978. All three contained analytical articles. Most important among the new organizations was the Society for Music Theory, founded in 1977, and its journal, *Music Theory Spectrum*, launched in 1979. *Music Analysis*, founded from King's College, London, in 1982 by Jonathan Dunsby, was the first periodical (at least since the days of Schenker) to be devoted specifically to analytical matters, representing a wide range of theories and approaches; and early issues of *Contemporary Music Review*, launched from Nottingham in 1984, featured largely analysis of contemporary music. A series of monographs, Studies in Musical Genesis and Structure, connecting source- and sketch-studies with analysis, was launched in 1985 with Lewis Lockwood as editor. In Germany the periodical *Musiktheorie* was inaugurated in 1986. A regular series of British conferences on analysis began in London in 1984 and was taken over by the newly formed Society for Music Analysis in the early 1990s.

Initially, the circumscription of analysis through its methods brought new levels of theoretical rigour and operational refinement in the wake of virtually autonomous development. By the mid-1980s, two methods had achieved the widest currency and were seen respectively as core systems for the analysis of tonal and atonal music. These were (1) codified Schenkerian techniques, and (2) techniques using pitch-class set theory. (A sharp distinction was thus drawn between tonal and atonal analysis.) A little later, as those engaged in analysis sought to define their discipline in relation to broader currents in contemporary thought, and those outside analysis correspondingly sought to understand its purposes and outputs, the perceived self-sufficiency of method-driven analysis diminished dramatically. Analysis in the late 1990s was seen as a critical activity, drawing on established ways of writing that came in part from its historical accumulation of methods, but with a significant shift from the model of forensic examination towards the construction of interpretations.

Many developments in the period can be understood against the context of three broad lines of inquiry that were followed in relation to Schenkerian analysis. One, reflecting a widespread belief in the potential of methodical analysis to offer insight into music of virtually any kind, involved the application of extended kinds of Schenkerian analysis to musical repertories that had not been Schenker's own concern, including music composed around the turn of the 20th century, early music, popular music and non-Western music. Another, reflecting a school of thought that valued formalism in both theory and method (and which considered analysis as the practical application of theory), saw a number of scholars seeking to rationalize and codify Schenker's approach into a rigorous combination of music theory and analytical method. A third line of development, mainly occurring towards the end of the period and reflecting the growth of a new musical criticism, saw studies that treated Schenker's work as a body of critical writing situated in the cultural and philosophical network of its time, and examined the reinterpretation of its language and ideas in the decades following World War II.

Pitch-class set theory arose from the desire of composers and theorists to find a way of identifying any combination of evenly tempered pitches without invoking the bias towards local pitch centres implied by tonal terminology (*see* SET). In mathematical set theory, which had its origin in the work of Georg Cantor between 1874 and 1897, the fundamental concept is that of membership. A 'set' is made up of the 'elements' that are members of that set. The set may contain 'subsets' all of whose elements are members of the set itself. Where several sets exist, certain relationships can apply among them: relationships of equivalence (in which one set can be reduced to another by some simple procedure), intersection (in which sets have certain elements in common), union (in which sets are joined together), complementation (in which sets have no elements in common and together make up all the elements of some larger order, often called the 'universal set') and so forth.

Aspects of set theory entered the theory of musical composition with J.M. Hauer's theory of tropes (1925), and are evident in the writings of René Leibowitz, Josef Rufer, George Perle, George Rochberg (1955, 1959) and Pierre Boulez (1964, chap.2; 1966, part ii). The proper formulation of a set theory of music was the work of Milton Babbitt (1955, 1960, 1961, 1972), Donald Martino, David Lewin and John Rothgeb (*JMT*, iii–v, x, xi). But while Babbitt's work, using particularly the mathematical concept of the group, dealt with harmony and with the functions of melodic and rhythmic configurations in 12-note music, and also with the interaction of components over longer spans of time, it belonged to the realm of compositional theory rather than analysis.

The most significant analytical contribution was made by Allen Forte (1964, 1965, 1972–3, 1973). Forte established a numerical notation for musical pitches by disregarding the octave in which they were sounded and treating enharmonically equivalent pitches as identical. All Cs (together with all B♯s and D𝄫s) were assigned to pitch class 0, all C♯s and D♭s to pitch class 1, and so on to pitch class 11 (all B♮s and C♭s). He reduced the number of possible collections of pitch classes to manageable proportions by classifying sets as identical if they could be reduced to the same 'prime form' by transposition and/or inversion, and established a system of labelling by which any prime form, and thus by extension any set, could be identified. These labels had two main elements, the first of which (the cardinal number) was simply the number of pitch classes in the set. The second element (the ordinal number) was, strictly speaking, arbitrary – it simply referred the user of the system to a list of prime forms published by Forte (1973) – but was also to some extent based on an assessment of the intervals that arose within the set (i.e. among its constituent elements). In a few cases, distinct types of set could by such assessment be observed to possess an identical 'interval-class content'; such sets were said to be 'Z-related', and 'Z' was incorporated into the names of both set classes. Examples of set class names include 3–1, 4–Z15, 4–Z29 and 9–1: of these, 4–Z15 and 4–Z29 are Z-related, and 3–1 and 9–1 are complementary, which is to say that for each set of type 3–1 there is a set of type 9–1 which includes exactly the pitch classes that the 3–1 set omits from the 12 available.

Analysis using set classes had to reckon with the fact that the theory of pitch class sets deals almost exclusively with sets of from two to 12 elements, so that a musical work containing perhaps many hundreds or thousands of notes had to be divided up into small units amenable to the categorization and comparison that the theory allowed. This 'segmentation' process remained dependent on informal musical judgment, despite receiving some attention from theorists such as William Benjamin (1979) and Christopher Hasty (1981). By contrast, the abstract relations among sets and set classes were the subject of considerable theoretical examination, for example by Robert Morris (1979–80, 1987), John Rahn (1980), Charles Lord (1981) and Eric Isaacson (1990). It is impossible, however, to observe a water-tight distinction between the processes of musical

segmentation and the assessment of pitch class set relations, nor can it be maintained that one is firmly the province of analysis and the other of theory.

Forte extended basic pitch class set theory to include the association of sets within ‘set-complexes’ (K) and ‘subcomplexes’ (Kh) – a ‘complex’ being an array of all the sets that are related by inclusion and/or complementation to any one given central class of sets (the ‘nexus set’). This established a type of organization that made possible the elucidation of atonal coherence in large-scale musical structures (Forte, 1978, on Stravinsky’s *The Rite of Spring*; Janet Schmalfeldt, 1983, on Berg’s *Wozzeck*; James Baker, 1986, on sonatas and orchestral works by Skryabin). A further extension of the theory was made by Forte in 1988 through a theory of pitch class set genera, which was based on a classification of all sets with four or more elements according to their trichordal subsets. 12 genera of varying sizes were thus constituted, with several large set classes being assigned to two or more genera. Each genus was linked informally with descriptions such as ‘chromatic’, ‘diatonic’ and ‘atonal’. The associated analytical procedure involved making a segmentation of a musical passage and tabulating those set classes to which it could thus be reduced, and then noting the genus (or genera) to which each set class in the analysis belonged and calculating the statistical significance of each genus’s representation in the sample. On this basis, weakly represented genera that were superfluous to the overall generic profile of the analysis were omitted. This typically left a generic profile based in quantified proportions on two or three genera, in a way that had been sensitive to the analytical context.

Fig.20 [not available online] is taken from Forte’s analysis (1981) of the first of Schoenberg’s Three Piano Pieces op.11. This uses a diagrammatic notation in parallel with a passage in score: the segmentation into pitch class sets is shown by enclosing pitch class letter-names in rectangles, circles and ovals, the result leaving space for set labels, bar numbers and other items. It can be seen that the analysis proposes three levels of structure in bars 1–8. In level (*a*), six of the hexachords (i.e. six-note sets) which are to be of great importance for the structure of the piece are identified (6–Z10/Z39, 6–16, 6–21, 6–Z42 and 6–Z44) along with several of the pentachords, which together with their seven-note complements are destined to be significant. Level (*b*) shows new ways of segmenting the musical fabric; level (*c*) shows in particular some of the trichords (three-note sets) which play on the surface of the music. The recurrent hexachords and pentachords are seen as the basic harmonic vocabulary of the piece, whereas the trichords are the foreground through which the analysis must penetrate. Among the hexachords, the importance given in the analysis to the Z-related pair 6–Z19/44 illustrates the interdependence of pitch class set theory, segmentation and critical analysis. One pitch class set of type 6–Z44 [10, 11, 0, 3, 4, 7] corresponds to those letters of Schoenberg’s surname which may be interpreted as letter-names for musical pitches (SCHBEG, extracted from ‘Schönberg’). Although this set class is represented only once in level (*a*) and the segmentation would be no less complete without it, Forte found significance in its appearance in a number of Schoenberg’s early works (1978). Elsewhere, the Z-relation allows him to assert the presence of Schoenberg’s ‘signature’ through sets of type 6–Z19 as well.

Other writers identified a number of specific pitch class collections as being of particular importance in early 20th-century music. The most prominent of these was the ‘octatonic’ collection – comprising, for example, the pitch classes C, D♭, E♭, E♮, F♯, G, A and B♭ (two further transpositions of the collection are available) – which had been discussed in analyses of music by Skryabin and Stravinsky by Perle (1962) and Arthur Berger (1963–4). The role of octatonic collections in the music of Debussy, Webern, Bartók and Skryabin was further discussed by Forte (1991, 1994), Richard Cohn (1991) and Wai-Ling Cheong (1993). The fullest investigation was carried out by Pieter van den Toorn (1977, 1983), who showed in exhaustive detail how interactions between this collection and the diatonic collection could be charted in much of Stravinsky’s music, taken from all the commonly recognized stylistic periods of the composer’s career. In doing so, van den Toorn indicated that the octatonic collection could be articulated into a network of characteristic harmonic and melodic features, including triads, dominant 7th chords and scale fragments.

Van den Toorn was not the only writer who developed an analytical method specifically in order to address the work of one 20th-century composer. Ernő Lendvai’s use of a theory of ‘axis tonality’ (1955, 1983) to analyse the mature style of Bartók projected a Reimannian conception of complementary tonic, dominant and subdominant functions on to a fourfold regular division of the octave. This produced three axes corresponding to the three tonal functions, which among them gave functional labels to all 12 pitch classes. Although the same regular division of the octave served also to link triads at intervals of a minor 3rd in the Stravinsky analyses of Berger and van

den Toorn, such points of convergence were not central to the work of any of these writers. Of greater importance was a sustainable belief in the authenticity of the analytical method to the composer's stated or unstated priorities. For example, the critical scrutiny that was directed at Lendvai's assertion that the formal proportions of many of Bartók's works were in correspondence with the Golden Section (a mathematical ratio whereby a twofold division of a line is made such that the ratio of the larger part to the whole is the same as the ratio of the smaller part to the larger part: *see* **GOLDEN NUMBER**) was concerned not so much with its analytical integrity as with its biographical value. In the absence of unambiguous documentary evidence that Bartók himself acknowledged this principle, speculation was directed at the possibility that a composer might follow it subconsciously. Lendvai's account of the characteristic harmonic and melodic intervals of Bartók's music in terms of the **FIBONACCI SERIES** (a sequence of numbers in which the ratio between adjacent terms tends towards the Golden Section, and which was famously associated by D'Arcy Wentworth Thomson with naturally occurring phenomena in plant growth) was clearly intended to play into such speculation.

This renewed concern of analysis with compositional method reflected a general expectation that analysis of 20th-century modernist works would assist in their broader comprehension. Appeals to biographical data and the composers' own writings frequently underpinned analyses of works by Schoenberg, Berg, Webern, Hindemith, Messiaen, Boulez and others who had given clear indications of their own technical procedures. Without necessarily showing greater technical rigour, these analyses achieved greater acceptance in the early part of the period than, for example, Roy Howat's assertion (1983) of Golden Section proportions in Debussy's works. Later in the period analyses that were not dependent on biography for their credibility came to be more widely valued. Among these were studies of Debussy by Richard Parks (1989), Bartók by Paul Wilson (1992) and Berg by Dave Headlam (1996). Other notable analytical studies of individual 20th-century composers included those on Britten by Peter Evans (1979), Berg by Douglas Jarman (1979), Bartók by Elliott Antokoletz (1984), Hindemith by David Neumeyer (1986), Varèse by Jonathan Bernard (1987) and Webern by Kathryn Bailey (1991). Bernard's graphic notation (see also 1981, 1983, 1987) was a notable individual innovation in presentation whose similarity to display formats routinely available in MIDI sequencing software by the mid-1990s suggested one possible route to future computer-assisted analysis.

Robert Morgan (1976) and James Baker (1983, 1986) were prominent in developing Schenkerian principles to reflect the changes in harmony and form evident in progressive music composed during the mid-19th century through to the turn of the 20th. These extensions of the technique found wider acceptance than had earlier comparable analyses of Stravinsky, Schoenberg and Bartók by Roy Travis (1959, 1965–6) and of Wagner by William Mitchell (1967). A number of writers including Craig Ayrey (1982), Anthony Pople (1983, 1989), Joseph Straus (1987), James Baker (1990) and Edward Pearsall tackled the question of how Schenkerian chord prolongation might be said to occur in post-tonal or atonal music, but little consensus was reached on this topic. Another approach to music of the early 20th century which seemed to have characteristics of both tonality and atonality (according to the common understanding of those terms) was to present linked analyses based on the application of both Schenkerian and pitch class set methods to the same musical passages. There was generally little attempt at a hybridization of analytical method or of underlying theory: the aim was rather to provide demonstration of the co-existence of tonal and atonal features through established methods. Notable examples of such writing were studies of music by Schoenberg and Berg by Forte (1978, 1985) and Janet Schmalfeldt (1991; see also Schmalfeldt, 1983).

Applications of adapted Schenkerian principles to early music, for example to Lassus by Mitchell and Isaac by Saul Novack (both 1970), and to Monteverdi by Salzer (1983), were no less contentious theoretically than were Schenkerian analyses of post-tonal music; they also failed to achieve ready acceptance among scholars and musicians with a lively historical interest in this repertory (see the discussion by Mark Everist, 1992). A number of later studies responded to this difficulty of assimilation by examining voice-leading in early music less rigidly in line with Schenkerian archetypes and more evenhandedly in juxtaposition with technical matters familiar from the history of theory and composition – such as cadence formation, modality, compositional process and text structure. Examples included work by Daniel Leech-Wilkinson and Sarah Fuller on Machaut (1984, 1987, 1992), and by Cristle Collins Judd on Josquin (1985, 1992). These writers were perhaps more successful in achieving a conceptual synthesis than were many of those engaged concurrently in analysis of the post-tonal repertory, though this was not necessarily recognized at the time.

Before these developments, early-music analysis that was independent in spirit had included

studies in 'proportional analysis' by Marianne Henze on Ockeghem (1968), Ernest Sanders on Philippe de Vitry (1975) and Brian Trowell on Dunstaple (1978–9). In a more occult vein, proportions in the music of Obrecht (Marcus van Crevel, 1959, 1964) and Bach (Ulrich Siegele, 1978) were said to be related to special 'cabalistic' numbers (whereby, for instance, 888 is associated with the Greek name for 'Jesus') or to numbers derived from simpler alphabetical summations (e.g. B–A–C–H = 2+1+3+8 = 14), whose presence in a piece was determined by counting metric pulses. The credibility of these types of analysis depended on either or both of two factors: the frequency and consistency with which a composer appeared to apply Golden Sections and other numerological devices over a wide range of his work; and any external circumstances that enabled one to infer a composer's interest in such matters, such as the composer's knowledge of and interest in mathematics, and his awareness of other art forms based on numerical principles (*see* **NUMBERS AND MUSIC**).

A similar pattern of developments may be observed in analysis of popular and non-Western musics during the period. Applications of Schenkerian techniques to popular music, including analyses of Gershwin by Steven Gilbert (1995) and Arthur Maisel (1990), of Beatles songs by Walter Everett (1987) and of American popular ballads by Forte (1995), began in the late 1990s to be absorbed into the broader study of music in popular culture. The close musical readings in Allan F. Moore's monograph on the Beatles' *Sgt. Pepper* album (1997) combined Schenker-style graphs of tonal and melodic frameworks with discussion of recorded sonorities, tempo relationships and, above all, the interaction of music with text (*see also* **POPULAR MUSIC**). The interpretation of text–music relations, and of music in relation to drama, image and narrative, had by this time become central in studies of opera and film music: it was in this vein that the analysis of music in popular culture seemed likely to develop, rather than through further accommodation with techniques derived from the analysis of Western concert music.

The eurocentrism of Schenkerian analysis did not cause it to be excluded totally from studies of non-Western music (see the discussion by Jonathan Stock, 1993), but semiological approaches (see below; *see also* **SEMIOTICS**) were more prominent in analytical writing on these musics. This was in line both with the origins of musical semiotics and with the anthropological methodologies that underpinned scholarly inquiry into the meaning and practices of music in other cultures. Influential authors in this broad field included Simha Arom (1985; Eng. trans., 1991; see also Nattiez, 1993) and Kofi Agawu (*see also* **ETHNOMUSICOLOGY**).

Explicit codification of Schenker's principles went beyond the earlier objective of bringing his work to the fuller attention of English-speaking musicians, something which was largely accomplished by the translation of *Der freie Satz* by the Schenker pupil Ernst Oster as *Free Composition* (1979). Together with subsequent translations, including those of *Kontrapunkt* (1987) and *Das Meisterwerk in der Musik* (1994, 1996, 1997), this largely displaced the need for texts such as Forte's presentation (1959) of Schenker's approach as a conception of musical structure, which had been instrumental in drawing the Austrian's work into the discipline of analysis as practised and understood by professional scholars in the English-speaking world, particularly the USA. The demands of music theory pedagogy, however, led to a need for textbooks in Schenkerian analysis which was initially met by those of Forte and Gilbert (1982) and David Neumeyer and Susan Tepping (1992). Examples of the use of Schenkerian techniques in analysis were too numerous to be usefully cited here. Among recurring concerns of such analysis were large-scale parallels across sonata-form movements made evident at a middleground analytical level, often involving voice-exchanges and/or the enharmonic reinterpretation of chromatic pitches. Examples were to be found among the writings of Eric Wen (1982), Carl Schachter (1983), David Beach (1993), and Roger Kamien and Naphtali Wagner (1997).

A second kind of codification of Schenker's work may be distinguished, more far-reaching than the first, in which theorists sought explicitly to refine and reinterpret Schenkerian principles along scientific lines into an explicit and rigorous body of theoretical constructs and analytical practices. Two such reinterpretations were undertaken by Gregory Proctor and Herbert Lee Riggins (1988) and Richard Littlefield and David Neumeyer (1992); an earlier, less explicit reformulation was given by Jonathan Dunsby (1980). All of these were apparently independent of the computer-based reformulations of Schenkerian concepts and procedures undertaken in the 1960s and 70s by Michael Kassler (1967) and Stephen Smoliar (1976–7).

Schenkerian thought was also one catalyst for the broad theory, based on analogies between linguistics and analysis, of Fred Lerdahl and Ray Jackendoff (1977, 1981, 1983). Under Noam Chomsky's influence, questions such as 'Does music have a deep structure?' and 'Do universals exist in music?' had fascinated musicians in the 70s. The series of lectures given under the title

'The Unanswered Question' by Leonard Bernstein in 1973, later televised, and published in 1976, raised these in a challenging fashion. In a series of articles beginning in 1977 and culminating in *A Generative Theory of Tonal Music* (1983), Lerdahl and Jackendoff, composer and linguist respectively, evolved a theory whose central purpose was to elucidate the organization that the listener imposes mentally on the physical signals of tonal music. Using principally music by Bach, Haydn, Mozart and Beethoven as their 'idiom', they compiled a grammar that 'models the listener's connection between the presented musical surface of a piece and the structure he attributes to that piece. Such a grammar comprises a system of rules that assigns analyses to pieces'. The system was thus like Chomsky's grammar in that it was 'mentalistic', that is, concerned with mental processes rather than with end-products, and in that it was at heart an analytic procedure in which the generative function of the theory was a system for deriving or testing analyses.

The theory of Lerdahl and Jackendoff had an outward resemblance to Chomsky's in that it was a set of rules operating on four components. These four were 'dimensions' of musical structure, and all were hierarchical: 'grouping structure'; 'metrical structure'; 'time-span reduction' (reduction in the Schenkerian sense, but based equally on pitch and rhythmic criteria); and 'prolongational reduction', which took account of the intuitive sense of tension and relaxation in music. Two types of rule governed each category: 'well-formedness rules' which controlled the making of possible structural descriptions of pieces; and 'preference rules' which determined which of a number of possible descriptions corresponded to a listener's preferences.

Three graphic conventions were adopted for demonstrating the operation of these rules. Grouping structure was shown as horizontal braces, and metrical structure as lines of dots, both below the staff and reiterated vertically to express hierarchy; reduction was shown as branching trees above the staff. Fig.21 [not available online] gives a small-scale example, which is a local time-span reduction. For prolongational reduction, the three diagrams acquire solid and void circles at the nodes to indicate the type of prolongation that the branching represented; reductive levels were displayed on separate staves below, adopting Schenkerian conventions for solid and void noteheads and solid and dotted phrase-marks. Fig.22 [not available online] shows the *St Anthony Chorale* analysed in this way (the original is already slightly reduced).

Lerdahl and Jackendoff claimed that much of their grammar was 'idiom-independent' (i.e. it held good whatever the musical style), and thus that certain of their rules constituted 'universals' of musical perception and could be taken to represent innate aspects of musical cognition. Their work was published at a time when points of contact between analysis and the cognitive sciences were gaining significant ground. The journal *Music Perception*, founded in 1983, included in its early issues a number of articles that reflected this, such as a group of investigations into hierarchical structures in music by Eugene Narmour, Allan Keiler, and Lerdahl and Jackendoff (all 1983–4), studies of synaesthesia in Skryabin and Messiaen by Peacock (1985) and Bernard (1986), and of the perceptibility of polytonality and serial organization by Krumhansl and Schmuckler (1986), Sandell and Sergeant (1987).

Many researchers in musical cognition took the results of musical analysis as a point of departure. Their focus was on such questions as whether the structures typically proposed by analysis were perceptible by others. To some extent this was a consequence of the difficulty of finding a proper role, in such empirical enquiry, for one of the characteristic aspects of analysis, namely the analyst's personal reflection on a musical work. For example, the large team of specialists built up in the late 1970s by Boulez at IRCAM in Paris sought to place acoustical and psychoacoustical research at the service of composers: in doing so it encouraged the analysis of the materials of music rather than of musical works themselves. Ironically, this general difficulty may have contributed to the development of an enhanced critical dimension in analysis, both by subjecting typical products of structural analysis to direct scrutiny and by making it seem that if analysis were transformed into a cognitive science it might surrender its capacity to foster new interpretations of pieces of music. This did not prevent the cognitive sciences from making a significant impact on musical thoery, however, as was shown, in addition to the theory of Lerdahl and Jackendoff, by Narmour's exceptionally detailed theory of melodic structure (1992), and Robert Gjerdingen's application of schema theory to phrase patterns in classical music (1986, 1988). The impact of these theories on analytical practice, however, was limited, whereas the Lerdahl–Jackendoff theory could be regarded as sufficiently predictive to warrant empirical investigation of the validity of its rules, for example by Irène Deliège (1987).

Empirical analysis of music in performance, by contrast, preserved a role for traditional score-based analysis as an agent of mediation in the interpretation of data concerning tiny nuances of articulation. Analysis of data gathered from performances was typically concerned with details of

timing. In the work of Eric Clarke and Bruno Repp there was a strong methodological component deriving from psychology or artificial intelligence (*see* PSYCHOLOGY OF MUSIC, §IV, and COMPUTERS AND MUSIC, §III). Other studies, for example by Nicholas Cook (1987), David Epstein (1995) and John Rink (1995), undertook a comparative assessment of data from different performances of a work in the light of basic musical analyses, which were often themselves developed further through a flexible analytical response to priorities observable in coherent performances. Although there was perhaps inevitably an implication that some performances studied were preferable to others, writing of this kind could be seen as distinct from discussions that gave principal consideration to the practical value analysis might have for performers seeking to develop an interpretation (notably Edward Cone, 1968, 1985, and Wallace Berry, 1989).

The relationship during this period between analysis and musical semiotics reflected the concern with analytical method, and later the suspicion of structural methods and structuralism generally, that characterized the trajectory of analysis as a whole (*see also* SEMIOTICS; the terms 'semiotics' and 'semiology' draw on different academic traditions but are used interchangeably). The foundations of musical semiotics were laid in a series of articles by the professor of linguistics at the University of Paris at Vincennes, Nicolas Ruwet. Ruwet's principle of 'distributional analysis' (1966, 1972) was predicated on a view of music as a stream of sounding elements governed by rules of 'distribution': that is, of ways in which the elements associate with or complement or mutually exclude each other. Its aim was to state these rules as 'adequately' as possible for any given passage of music, or work or group of works; to formulate, in other words, a syntax for the music. Its method was to break the stream of music into component units (or 'unities' – i.e. units that either could not be further subdivided or did not need to be because their sub-units never occur independently). All possible units were compared with all other possible units; when an identity was found, the contexts of the two occurrences were examined for identity. From this comparative analysis emerged a list of all 'distinctive units', an account of the distribution of each, and a grouping into units distributed in identical or related ways; and ultimately a restatement of the stream of music in terms of these units and the laws that govern them. The success of this exercise lay not so much in the quality of the finished analysis as in the fact that it had been produced by an exact and verifiable procedure.

Ruwet's analysis triggered a dispute among semiologists as to whether in such a mechanized procedure the analysis should begin with musical units of large proportions and work towards a microscopic finished analysis, or begin with a microscopic segmentation and gradually construct the larger formal units by the recognition of equivalence between phrases that were distinguished only by differences of detail. The immediate dispute was won by the second school of thought, and the Montreal-based scholar Jean-Jacques Nattiez (1975) aroused remarkable interest with intensive analyses that proceeded from small-scale segmentation. Despite the variety of Nattiez's means of presentation (which included the tree-structure diagram, the lexicon of items and the table of distributions), and despite the apparent limitation of distributional analysis to monophonic music, or at any rate to a single melodic line, the distributional principle was for a while adopted as if it were an analytical method to be set alongside Schenkerian and set-based methods. The comparison of uninterpreted 'unities' was seen as a productive strategy in the analysis of otherwise intractable modern scores (e.g. Nattiez's analysis of Varèse's *Density 21.5*, 1975; Eng. trans., 1982) and in music whose interpretation seemed prey to ambiguities. Among the subsequent products of this line of work were a full-scale analytical study of Berio's *Sinfonia* by David Osmond-Smith (1985) and Nattiez's study of the 1976 Bayreuth performance and production of Wagner's *Ring* cycle (1983; see also 1985).

Nattiez's work followed a branch of semiotics that proposed a partition of the semiological space into three levels: the 'poietic' level, which concerned the relations between the score and the composer (or performer, if the object of study was a performance); the 'esthesic' level, which concerned the relations between the score (or other musical object) and its interpreters; and between these two the 'neutral level' (*niveau neutre*), a supposedly uninterpreted domain within which distributional analysis was to take place (see Molino, 1975; Eng. trans., 1990). The neutral level was soon acknowledged as problematic, however, since even the most basic division of an object into 'unities' demanded some rudimentary understanding, and this implied that semiosis had taken place. Once the neutral level had been revealed as a methodological convenience it was clear that the concerns of semiology, properly understood, were not so easily to be brought into conjunction with the practice of analysis. Nattiez's later writings (e.g. 1985, 1990) addressed this difficult relationship with responsibility; others such as Simha Arom (1969), David Lidov (1975), Raymond Monelle (1992) and Eero Tarasti developed musical semiotics along more secure and conventional semiological lines. But the encounter with the directly analytical semiotics of Ruwet

and Nattiez served to encourage analysts including Agawu (1991) and Robert Samuels (1995) to develop wide-ranging arguments that assisted in broadening the perspectives of the discipline: the former presented a rich synthesis of viewpoints on the Viennese Classical style, and the latter an analysis of Mahler's Sixth Symphony that dealt equally in close motivic analysis and the work's wider cultural resonances.

The semiological focus of these writings notwithstanding, both Agawu and Samuels readily incorporated Schenkerian analyses in their work, thereby reflecting the dominating impact of Schenker's ideas on professional analysts. Some writers, however, exhibited a concern that these ideas had been transmuted in the course of being assimilated into a mainstream of analytical practice. Returning to Schenker's own writings and re-reading them in the context of his own time, they drew attention to considerable disparities that had thus arisen, although their criticisms were often directed against earlier interpreters of Schenker rather than against their own contemporaries. Prominent among these writers were William Rothstein (1986) and Robert Snarrenberg (1994).

The rise of such criticism reflected the growth of analysis into an academic discipline with sufficient maturity and self-awareness to question its own assumptions and practices. The early part of the period had seen the publication of analysis symposia, notably in the *Journal of Music Theory*, in which musical works were discussed by two or more authors using contrasting analytical approaches. A collection of these symposia, through which Schenkerian analyses of pieces by Mozart, Schubert, Beethoven and Brahms were contrasted (by implication favourably) with analyses that followed a variety of other methods, appeared under the editorship of Maury Yeston in 1977. By around 1980, however, this practice had largely fallen away, leaving Schenkerian analysis and pitch class set methods supremely prominent, with the additional consequence that repertories central to the development of those methods were taken as points of reference in the discussion of other musics.

It was at this time that an influential attack on the discipline by Joseph Kerman (1980) advised musical scholars 'how to get out' of analysis. Perhaps the most substantive of Kerman's observations were that analysis tended to concentrate on 'masterworks' and, concomitantly, that it took the aesthetic value of its musical objects of study as a given. In his view this discouraged the exercise of a properly critical faculty that was the first duty of a musicologist. The new florescence of critical writing encouraged by Kerman's wider commentary on musicological disciplines (see Kerman, 1985) did not have a great impact on the practice of analysis until it addressed issues of theory. When it did so it brought post-structuralist critical theory to the attention of musical scholars at a time when the influence of semiology was receding. Derridean thought centred on ideas of deconstruction was powerful in undermining the *de facto* definition of analysis as a constellation of methods among which a mere two methods were overwhelmingly prominent.

Deconstruction wilfully evaded linguistic definition, being presented in the writings of its adherents such as Jacques Derrida and Paul de Man as a deliberately method-free and ruthlessly opportunistic approach to literary texts (*see* **DECONSTRUCTION**). Its *modus operandi* was to observe internal contradictions in linguistic usage, and other peculiarities within the text, whose consequences could be pursued so as to reveal underlying assumptions or motivations – broadly speaking, ideologies. It also managed to offer a sustained critique of structuralism in all its guises. This allowed the musical scholar Alan Street, who wrote influentially of 'superior myths' and 'dogmatic allegories' (1989), to attack one of the touchstones of structural analysis: the principle of unity. David Montgomery (1992) addressed 'organicism' in similar terms. Perhaps as a result of such criticism, structural analysis in the 1990s was wary of organicism and often spoke of 'coherence' rather than 'unity'. At the same time, writers who sought to apply deconstruction to music still found it easier to deconstruct analytical and critical texts about music than to address musical texts directly.

One line of literary critical practice with immediate potential for application to music was narratology (*see* **NARRATOLOGY, NARRATIVITY**), which sought to interpret individual literary examples of narrative against archetypal qualities and structures of narrative. Anthony Newcomb addressed instrumental works by Schumann and Mahler in this way (1983–4, 1992). His approach was open to the criticism that it simply revisited structural analysis under a new agenda, mapping narrative characteristics on to musical structures. Seen more positively in this light, however, it could be said to have provided a precedent for such potentially far-reaching analytical insights as the new interpretation of form-building processes in Sibelius's Fifth Symphony put forward by James Hepokoski (1993). A different relationship between structural analysis and literary criticism was pursued influentially by Lawrence Kramer (e.g. 1990, 1992–3). Working frequently with texted music, Kramer proclaimed the value of a hermeneutic approach, seeking 'hermeneutic windows …

through which the discourse of our understanding can pass' (1990, p.6). The range of reference in his interpretations was remarkable, and included psychoanalytical, feminist and other gender-related modes of criticism. Kramer made use of structural analysis, for example Schenker's analysis of Haydn's 'Representation of Chaos' (from *Das Meisterwerk*, ii, in Kramer, 1992–3), together with analyses of his own. It is perhaps revealing that frequently in his writings a 'hermeneutic window' is to be found between structural analysis of the music and literary or cultural analysis of the text (or of another overt representational meaning of the music). In this sense Kramer's work, like Newcomb's, revisits a long-standing concern, in this case about the relationship between music and text, or more broadly between the musical and the extra-musical. Another author whose insights lay at this boundary was Carolyn Abbate, who developed a musical analogue of the concept of a narrative voice (1991). Much of Abbate's work centred on 19th-century opera, which was an important focus for scholars seeking to combine structural analysis with textual interpretation, such as Warren Darcy (1993, 1994) (*see also* **CRITICISM, §III**).

Joseph Straus (1990) and Kevin Korsyn were among analysts who made direct use of the literary critic Harold Bloom's theory of the 'anxiety of influence' in comparing musical works written by composers of different generations. Korsyn (1991) measured Brahms's Romance op.118 no.5 against Chopin's Berceuse op.57 through a close comparison of musical detail and correspondences of design, concluding that 'Brahms incorporates Chopin's text into his own, but … then breaks with [it], resisting influence, choosing himself rather than the precursor' (p.57). Straus's examination of compositions by Bartók, Berg, Schoenberg, Stravinsky and Webern maintained that tonal allusions observable in them were traces of an inescapable past that these composers had nonetheless mastered, and argued firmly that the musical coherence of such works should be addressed through atonal, serial or other post-tonal analytical techniques.

Another important development during the 1980s and 90s was a reconsideration of the history of analysis, notably by Ian Bent (1984, 1994, 1996). In particular, Bent identified precedents for the critical-analytical hermeneutics of the 90s across a wide variety of 19th-century writings on music, not all of which had previously been considered analytical in nature or intention. A number of other scholars, such as Alastair Williams (1997), found a different impetus towards an analytical criticism that exposed ideologies, while dealing rigorously with musical detail, in the writings of Theodor W. Adorno.

Derridean deconstruction presented an alternative to the linkage of structuralism and phenomenology – identified by Derrida himself in his critique of Husserl – that was proposed as a broad analytical strategy by David Lewin in a series of writings from the mid-1980s on. Phenomenology is a 'science of experience'. It is concerned not with the world as natural object or with mind as a store of knowledge. It deals with the contact between object and mind; it studies consciousness directed towards objects ('intentionality'), and aims to describe the structure of consciousness. An early example of musical phenomenology was the massive two-volume study by the Swiss conductor and mathematician Ernest Ansermet (1961). Ranging across mathematical, acoustical and philosophical issues, it reached a study of musical structures that centred on the idea of the 'melodic path' (*chemin mélodique*). Classifying intervals as 'active extrovert', 'active introvert', 'passive extrovert' and 'passive introvert', it tried to give a value to the degree of tension in a melody. Other pioneers of musical phenomenology were Philip Batstone (1968–9), Lionel Pike (1970) and Thomas Clifton (1983), though their writings showed little consensus (*see also* **PHILOSOPHY OF MUSIC**).

A concern with immediate perception also motivated developments in the analysis of phenomena of timbre, melodic contour and aspects of rhythm and metre. Robert Cogan and Pozzi Escot (1976) took phonological analysis, as performed in the field of linguistics, as a model for investigating what they called 'sonic design' – the way in which sound-spectra are shaped in musical space. Their contention was that compositions are just as much formations of basic sonic stuff as formations of tonal or rhythmic materials, and that composers and eras of music often bear recognizable sonic 'fingerprints'. They made resourceful use of graphs to carry out tone-colour analysis of single instrumental sounds and ensembles and also made use of sound-spectrum analysis, a technique developed by IBM which was capable of photographing the sonic 'content' of a whole composition. Cogan provided an analysis of Stravinsky's *The Rite of Spring* in his journal *Sonus* (1982), and in 1984 presented a series of analyses together with a theory of tone-colour strongly influenced by the linguist Roman Jakobson. Studies of melodic contour were less spectacular in their presentation, frequently being expressed in numerical or symbolic terms reminiscent of pitch class set analysis, though with the important difference that the order of terms was crucial in defining a sequence of directed intervals or of changes of direction. Foundations for future work were laid by Michael Friedmann (1985), Elizabeth West Marvin and Paul Laprade

(1987), Larry Polansky and Richard Bassein (1992), Robert Morris (1993) and Ian Quinn (1997).

Like much work in the analysis of contour, Lewin's broad phenomenology (1985–6) was presented in formal terms suggesting the use of Artificial Intelligence as a metaphor:

> "I propose as a provisional model for 'a musical perception' this basic formula:
> p = (EV, CXT, P-R-LIST, ST-LIST)
> Here the musical perception p is defined as a formal list containing four arguments. The argument EV specifies a sonic *event* or family of *events* being 'perceived'. The argument CXT specifies a musical *context* in which the perception occurs. The argument P-R-LIST is a list of pairs (pi, ri); each pair specifies a *perception* pi and a *relation* ri which p bears to pi. The argument ST-LIST is a list of *statements* s1, …, sk made in some stipulated *language* L."

Similarly, Lewin developed structural analysis through a theory of 'generalized musical intervals and transformations' which was expressed in terms of the formal apparatus of mathematical lemmas and theorems (1987). The underlying principles of his approach were, first, that 'intervals' of some kind are found in many musical domains, including most obviously pitch and rhythm (each of which can be measured in a number of ways), and that their means of measurement can be modelled by simple mathematical operations; and, secondly, that any interval, for example the interval of two semitones between middle C and the D above it, can be expressed equivalently as a particular 'transformation' of the C into the D or vice versa (in this case a transposition upwards or downwards by two semitones). The second principle is harder to grasp than the first, but its potential to refocus musical reflection is correspondingly greater: it allows something that is intuitively thought of as a transformation of one musical object into another, such as a statement of a theme and a statement of a variant of part of it, to be brought within the same mathematical framework as something that is intuitively conceived as a relationship between two musical objects, such as the pitch interval between two notes, or the interval of time between successive statements of a fugue subject.

Lewin's theory of transformations was based on mathematical group theory, a powerful development of set theory which does not merely deal with collections of objects but associates those collections with specific operations on the objects. In analytical applications, for example by Lewin himself (1993) and by Henry Klumpenhouwer (1992; see also Lewin, 1990, 1994), it resulted in descriptions that reflected musical complexity as networks of transformations (and of transformations of transformations etc.) each of which was defined mathematically and could be labelled in a way that reflected the phenomenological import of the transformation. The application of group theory to late 19th-century harmonic practice was also more directly explored by both Lewin himself (1983–4) and later writers including Cohn (1991, 1996).

During this period analysis may be said variously to have come into intimate contact with the cognitive sciences, semiology and critical theory, to have taken on the style if not the substance of applied mathematics, and to have defined itself as an academic discipline before dissolving that definition in favour of a millennial uncertainty. Of all the cognate disciplines, it is criticism that is presently the hardest to differentiate clearly from analysis. Both tend firmly towards the formalist side of what can be identified as a formalist/historicist divide, but if this has focussed 'formalism' as a sensitive issue, it must be acknowledged that those engaged in the new musicological criticism of the 1980s and 90s were less happy to be seen as formalists than were those whose primary concern was to develop structural analysis. Indeed, the concern of analysis with structure might still be taken as a defining characteristic – were definition itself not shunned by many of its practitioners today. In these circumstances it seems right to acknowledge that structures are now understood to be asserted rather than discovered, that the analyst is more inclined than ever to see his or her work as the writing down of interpretations from a personal perspective, and that charting the discipline historically has been one catalyst in making the languages of analysis a focus of self-awareness for those who read and write with them.

BIBLIOGRAPHY

Ian D. Bent/Anthony Pople