

# A Provisional History of Spectral Music

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The current musical scene is replete with a mass of currents and counter-currents. The certainty of historical purpose which infused the earliest seminars and publications of the Darmstadt group is largely unthinkable today. Indeed, no recent compositional trend, not even minimalism, has made comparably dogmatic and exclusive claims upon music's present, let alone its future. In attempting a historical and comparative survey of so-called 'spectral music,' therefore, it must be made immediately clear that few of the composers whose music might at one time or other have been described as 'spectral' had any conscious notion that they might have constituted a coherent group. There is no real school of spectral composers; rather, certain fundamental problems associated with the state of contemporary music, since at least 1965, have repeatedly provoked composers from widely different backgrounds into searching out some common solutions involving the application of acoustics and psycho-acoustics to composition.

As will be evident from the generality of that last phrase, not the least of the problems associated with spectral music is arriving at a clear, generally acceptable definition of the term. As far as I can ascertain, the nomenclature 'spectral' is regarded by virtually every major practitioner of the trend as inappropriate, misleadingly simplistic and extremely reductive.<sup>1</sup> The use of spectra, whether harmonic or non-harmonic, is

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1. See, for example, Murail (1989).

only the most superficial feature of the music of these composers. A much more fundamental concern shared by most of these composers is with the conscious composition of the degree of predictability or unpredictability in their music, and a consequent fascination with the psychology of perception. Finally, most composers involved with this tendency share an inclination to transcend the limits of parametric composition: the serial obsession with devising separate or related charts for pitch, duration, intensity, dynamics and timbre is replaced with a fondness for attempting to abolish the distinctions between these phenomena. This is especially true for the French composers discussed in these two issues, who have shown a particular fascination with so-called 'complex sounds'<sup>2</sup> — sounds such as harmonic spectra, harmonic or non-harmonic FM spectra, bell sounds and multiphonics, all of which elide the distinction between harmony and timbre. We shall come back to this point later, but it is interesting to note here that the prevalence of an obsession with transcending the limits between parameters led Gérard Grisey to suggest the adjective 'liminal' as an apt epithet for the trend.

### *A brief pre-history*

The origins of spectral music are so diverse and numerous that no single survey can pretend to be exhaustive. The attempt to relate musico-cultural activity to (supposedly) natural laws of acoustics has been a mainstay of musical theory since the time of the ancient Greeks. In the West, this tendency is best exemplified in the treatises of Mersenne, Tinctoris and Rameau, the latter significantly attempting to establish the origins of French Baroque tonal harmonic practices in the harmonic spectrum (although the results were heavily disputed by leading German musicians of the day, not least J. S. and C. P. E. Bach).

In the twentieth century, treatise after treatise has used the harmonic spectrum to justify the most diverse compositional styles. Harry Partch devised his scale of 43 notes to the octave in order to incorporate a maximum of just intervals derived from overtone proportions — as explained in his treatise *Genesis of a Music*<sup>3</sup> (circa 1945) — and designed his own instruments to perform music written in the scale. Henry Cowell's remarkable treatise *New Musical Resources*<sup>4</sup> (1919, published

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2. See Murail (1980), an article significantly entitled 'La révolution des sons complexes.'

3. See Partch (1949, 1974).

4. See Cowell (1996).

1930) includes an elaborate sequence of theoretical constructs derived by analogy with the harmonic spectrum: not content with inventing harmonic systems derived from it, Cowell goes significantly further than any theorist prior to World War II in devising a complex rhythmic system by superimposing poly-rhythms in the proportions of harmonic spectra. He draws a parallel between the composition of timbres and rhythmic patterns; exactly the same premise, with similar rhythmical results, was to be a crucial building block nearly forty years later in Stockhausen's *Gruppen*. Since Cowell's treatise also proposes the devising of a chromatic scale of twelve tempi, one of which is extraordinarily similar to the tempo scale idea equally fundamental to *Gruppen* (and to most of Stockhausen's music since then), one cannot help wondering whether Stockhausen had seen Cowell's treatise before starting his composition... In any case, Cowell's theories were to be acknowledged as the inspiration for the rhythmic explorations of Conlon Nancarrow in his long sequence of studies for player piano. Both Cowell and Partch also include a survey of what they term 'undertones' — a theoretically dubious concept comprising an exact intervallic inversion of the harmonic spectrum, devised in order to provide a 'natural' justification for the minor triad.

All of this proved a crucial influence on the minimalist composer La Monte Young, who is a precursor of spectral music to some degree. La Monte Young shares with much early spectral music an interest in sounds of long duration and music whose rate of change is very slow. In La Monte Young's case, however, the duration is considerably longer than for any spectralist: a single sound can last for seven to ten minutes or more (often with the help of electronic equipment), and the rate of change reduced to such an extent that the music often seems totally immobile. Together with all this, La Monte Young has shown close interest in just intonation and the harmonic series. Pieces such as *The Tortoise, his dreams and journeys* (1964–) and *The Well Tuned Piano* (1965–, for a piano tuned in overtones of a low E-flat) exploit extremely refined tuning systems in music of such limited pitch content that the listeners can absorb the unusual tuning carefully and perceive it in all its richness. Timbre, too, becomes all important.

Paul Hindemith's important treatise *The Craft of Musical Composition*<sup>5</sup> (1942) is an unusual case of a composer attempting to explain the basis of his entire harmonic world through a variety of acoustical phenomena. Hindemith devised scales of relative intervallic consonance and dissonance which he used as determining factors in all his music from the

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5. See Hindemith (1942).

early Thirties onwards. Hindemith places great emphasis upon the derivation of his scales from not only the harmonic spectrum but most especially from sum and difference tones — as far as I can judge, one of the earliest compositional examples of the use of what we now call ring modulation harmony, and it is no accident that Gérard Grisey has cited the Hindemith treatise as an inspiration for his researches into sum and difference tones as generators of harmonic fields.<sup>6</sup> In common with Cowell and Partch, Hindemith repeatedly cites his acoustical researches as 'natural' justification for his theories, implying that they are therefore inherently superior to other theoretical conceits of the time such as the twelve-tone system, for which he presumably felt no such natural justification could be found. This is, of course, a logical fallacy: whoever said that art music, by nature constructed and the product of complex socio-cultural phenomena, had to be based in nature? But it is a fallacy which will recur frequently throughout the second half of the twentieth century.

We find a similar recourse to nature as a justification for modal and harmonic procedures in Messiaen's *Technique de mon Langage Musical* (1942): here, the harmonic spectrum is used to defend Messiaen's favorite cadence stressing the augmented fourth — a common feature of his music employing the octatonic scale (or 2nd Mode of Limited Transposition, as he terms it). Equally, we observe Messiaen devising a 'chord of resonance,' a two-octave eight-pitch aggregate comprising harmonics 4–15 of the harmonic spectrum, superimposed in equal temperament; this chord was to remain an important element in his harmonic vocabulary right up to his death. In his treatise Messiaen further employs the harmonic spectrum to justify his use of 'added resonance' — dissonant upper pitches added to a diatonic triad in the middle register; and also to justify his fondness for 'inferior resonance' — dissonant clusters of notes, often at the bottom of the piano, added to a higher diatonic triad. In the latter case, however, Messiaen also cites the complex timbres of metal percussion instruments, especially bells, gongs and tam-tams, as the most immediate analogy with this type of harmony, and in this respect he looks forward directly towards the French spectral composers, who have a long standing fascination with the instrumental simulation of such non-harmonic sounds. In several passages of his instrumental piece *Couleurs de la Cité Céleste* (1963) Messiaen's interest in composing resonance is manifested in his attempts to transform the timbre of low trombone pedal tones played *fortissimo* by adding high three-part chords played *piano* on three clarinets. The higher pitches of the clarinets are

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6. In private conversation with the author, November 1995.

either picked from harmonics of the trombone tones, or from pitches foreign to the harmonic spectra of the trombone tones concerned. In the former case, the clarinet sounds tend to fuse with the trombone sounds; in the latter case, they provoke a degree of distortion of the trombone timbre. A comparison of these passages with the opening of Grisey's *Partiels* (1975), in which a trombone spectrum is simulated by an instrumental ensemble, shows to what extent the French spectralists emanated very directly from certain aspects of Messiaen's thought. Messiaen has also stated that his birdsong derived pieces feature a special type of harmony which is close to that found in spectral music: 'When I reproduce a birdsong, every note is provided with a chord, not a classified chord but a complex of sounds which is designed to give the note its timbre.'<sup>7</sup> The resultant harmony is thus on the cusp between harmony and timbre which is a source of such fascination for spectralists.

In his fondness for added and inferior resonance, Messiaen admits to being highly influenced by the music of his colleague André Jolivet (1904–1974), whose early piano works *Mana* (1935) and the *Cinq Danses Rituelles* (1939) include many fascinating varieties of such resonances, and whose exploitation of the extremes of piano registers and textures was certainly to have an effect on Messiaen's *Vingt Regards* (1944), *Canteyodjaya* (1949) and the two *Iles de Feu études* (1950). Jolivet also devised a variety of harmonic aggregates from superimposing harmonic spectra — a procedure later also found in Murail's *13 Couleurs du Soleil Couchant* — and at least one of the resultant chord progressions was subsequently adopted by Messiaen in his own music of the time.<sup>8</sup>

Jolivet studied with Edgard Varèse and the latter is widely regarded as a forerunner of spectral composition by its leading practitioners. The Canadian composer Gilles Tremblay, later one of his country's leading representatives in the field of spectral music, studied with Varèse at the start of the fifties and has recounted that Varèse said to him: 'Let's not forget that, for us as musicians, *sound* is one of our best teachers. That is why we should observe it and study it: its lessons are inexhaustible.'<sup>9</sup> According to Tremblay, Varèse considered the harmonic spectrum 'a basic phenomenon, the harmonic phenomenon which transcends our

7. Olivier Messiaen. *Musique et Couleur, Nouvelles Entretiens Avec Claude Samuel*, Belfond, Paris, 1986, p. 102.

8. C.f. Jolivet, *Cinq Danses Rituelles*, no. 3 'Danse Nuptiale,' opening chord progression; compare with Messiaen, *Trois Petites Liturgies de la Présence Divine*, no. 1, the chord progression at the words 'Soleil de sang, d'oiseaux'; see also Messiaen, *Harawi*, no. 1, the *Cinq Rechants*, no. 1, and *Canteyodjaya*.

9. Gilles Tremblay: 'Acoustique et Forme chez Varèse' in *La Revue Musicale*, triple issue nos. 383–385, Richard Masse, 1985.

era'<sup>10</sup> and his fascination with sound for sound's sake resulted in a number of works in which the notion of timbre is elevated to a compositional principle. The American composer Morton Feldman, who knew Varèse well in the forties and fifties, has remarked upon the fact that 'the matching in Varèse's music of harmonic aggregate to instrumental timbres is almost uncanny,' and indeed a work like *Intégrales* (1924) largely consists of *blocs sonores*, each sharply defined in register, intervallic content and instrumentation. Analysis of such phenomena has so far proved problematic, as conventional analytic methods have developed extremely refined means of examining pitch but not timbre.

Another frequently cited progenitor of spectral music is the Italian composer Giacinto Scelsi (1905–1988). There are two aspects to this influence. Scelsi's sequence of radically focused works composed after the late fifties, such as the *Four Orchestral Pieces on a Single Note* (1959), reduced pitch content so completely that the listener is forced to examine otherwise unnoticeable minutiae of sound, such as harmonics, beats and difference tones. Although Scelsi did not investigate spectra in his harmonic thinking, the extremely sustained texture of his later music sometimes resulted in a fascination with gradual, continuously evolving processes which would prove suggestive to Murail amongst others. The most notable example of this is Scelsi's Fourth String Quartet (1964), which traces a steady, albeit irregular rising band of pitches which climbs about a sixth over the work's eleven minutes.

Of the three other immediate influences, paradoxically all are members of the generation of composers belonging to or associated with the Darmstadt group of fifties serialists. György Ligeti's texture-based music — pieces such as *Atmosphères* (1961) and *Lontano* (1967) — shared with Scelsi's music (unknown to Ligeti at that time) a preoccupation with slow rates of change and dense, continuously evolving textures. This had an obvious effect not merely on Grisey and Murail but later on the music of Kaija Saariaho as well. Murail has also cited a less known source of this type: the early music of Frederich Cerha, who later became famous for completing the orchestration of the Act III of Berg's *Lulu*. In a large-scale cycle of orchestral pieces entitled *Spiegel*, composed from 1960 to 1962, independently from both Ligeti and Scelsi, Cerha evolved his own form of radical texture music which involved splitting the orchestra into perpetually fluctuating masses of sounds. Perhaps the finest of the set, *Spiegel V* for orchestra and electronic tape, features a remarkably sophisticated fusion of electronic and instrumental sound into a seamless flow in which, as in Scelsi, conventional formal divisions are completely

10. Interview with Gilles Tremblay in *Salabert Actuels*, November–December 1988.

elided in favor of a single, unidirectional process. Although he did not know the *Spiegel* cycle at the time, Murail's first fully characteristic work *Sables* (1974) shares many attributes with the pieces of the cycle.

Several pieces by Karlheinz Stockhausen deserve mentioning here. *Stimmung* (1967) for six vocalists is certainly an early example of spectral composition: a single harmonic spectrum on B-flat is filtered by perpetually changing phonetic coloration on the six voices, who also emphasize individual partials by using overtone chanting. Certainly, this is a remarkable instance of applying acoustic research to composition in a thoroughgoing and consistent way: one notes that the large-scale harmonic vocabulary (a single harmonic spectrum) is identical with the small-scale detail (made up of the individual harmonic spectra projected by each of the six voices). The one feature that is lacking is a clearly directional process; instead, and typically for Stockhausen at this time, the piece consists of a series of moments with no evident overall direction at all. In this as in other respects, one senses the influence of La Monte Young, whose music Stockhausen almost certainly knew.

Stockhausen's *Mantra* (1970) for two pianists and live electronics, is a more complicated case; although it was certainly an inspiration for many early spectral composers such as Claude Vivier and composers such as Johannes Fritsch, Peter Eotvos and others of the 'Feedback Studios' in Cologne. *Mantra's* most immediate feature is its use of a single melodic formula to determine both large form and small-scale detail, a compositional technique Stockhausen has been using ever since. For the present purposes, the most important feature of *Mantra* is its use of ring modulation to color the piano timbre. Each of the thirteen sections of *Mantra* is based around one of the thirteen principal notes of the work's melodic formula: the first piano has the original series, the second piano the inversion, each starting from a central pitch A3. In addition, each pianist operates a ring-modulator and a sine-tone generator to modulate the piano sound. The pitch of each sine-tone generator changes according to the series of principle pitches just outlined, again starting from the central pitch of A3. Any pitch played on one of the pianos will have a specific relationship to the pitch of its sine-tone generator, from extremely dissonant to totally consonant and the timbres of the ring-modulation will vary in parallel from non-harmonic to harmonic, the most harmonic timbres resulting from notes in octave unison with the sine-tones, or in simple triadic relationships to them.

Stockhausen speaks of this perpetual oscillation between dissonant and consonant timbres as a movement from tension to relaxation and back, analogous to human breathing. Certainly the listener can easily hear the consistency of timbre and melodic form which permeates the music, not least in the opening and closing sections of the music, as the pitch A3 is

central to both pianos and sine-tone generators in these sections. The range of consonant timbres produceable with the A is considerable: any pitches of the triads of A-major, F-major or D-major. Because these relationships are heard repetitively over the duration of these sections, the listener grows accustomed to the timbres, and can quickly predict which timbres will associate with which piano pitches. The ring-modulation sound loses its 'exotic,' unfamiliar quality and it becomes possible to hear inside the timbres, to hear them as real harmony, a feature which was to prove highly suggestive to many younger composers.

An independent figure from Denmark provided what I would argue is the first properly instrumental piece of spectral composition. Born in 1932, Per Norgaard had started his career as a typically Nordic composer in the mold of Sibelius; later he broke out into a form of modernism and explored collage and electronics. By the late sixties, he had reached an analogous state of research to that of Ligeti and Cerha, with a series of orchestral works exploring timbre through density and slowly transforming textures. The cluster forms only one part of this vocabulary; there is a considerable degree of multi-layered melodic development, and also a fondness for harmonic spectra — often several are superimposed at different speeds as in the case of his remarkable orchestral work *Iris* from 1967. The following year, he composed a still more radical work, *Voyage into the Golden Screen*, for chamber orchestra. Only in its mood of concentrated stillness does this work relate to the song by Donovan from which it takes its title. There are two movements, of which the first is quite without precedent in any European music of the time. The music is entirely based upon two harmonic spectra a quarter-tone apart, on G and A-flat lowered by a quarter-tone. These spectra are simulated in just intonation mainly on the orchestral strings, which necessitates *scordatura* for the violins, violas and cellos (parallel with Scelsi!). Each spectrum unfolds gradually against the other, and as they clash their very proximity results in strong difference tones ('beats'). This culminates in the huge, blurred multiple octave at the climax of the piece, which sounds uncannily similar to Scelsi, and has similar recourse to noise producing devices, such as buzz sounds on the harp, flutter-tonguing and varying bow pressure to emphasize the grainy timbre of multiple 'beats.' It should be emphasized that Norgaard had absolutely no idea of Scelsi's work at this time — it was largely unknown — and was extremely surprised when he did first hear Scelsi's *Four Pieces!* The work also contains curious pre-echoes of Grisey, Murail and the work of the feedback group, although these composers have remained uncognisant of Norgaard's work. Nevertheless, *Voyage into the Golden Screen* is an important precursor of spectral music, perhaps the most direct of all, and must be recognized as such.

### *The second phase: the seventies and early eighties*

Spectral Composition is properly the creation of composers from the following generation. There are several distinct centers of development, some of which were in sporadic contact throughout this period. Paris and Cologne were the two principal centers, each with its group — *L'Itinéraire* and Feedback Studios respectively. As the work of *L'Itinéraire* is well covered in the second issue, a brief history of Feedback seems appropriate at this point.

The group was founded by a number of former pupils, associates and assistants of Stockhausen in 1970: Johannes Fritsch, Rolf Gelhaar, Clarence Barlow<sup>11</sup> and Mesias Maiguashca amongst them; several other composers, notably Claude Vivier and Peter Eotvos, appear to have maintained occasional contact with the group. Feedback Studios functioned not merely as a group of like-minded composers but also as a publishing house for their works (and still does). The influence of Stockhausen is certainly a factor in their music, and the particular varieties of spectral composition found in their work were perhaps triggered by *Mantra* and *Stimmung*.

Maiguashca's music oddly combines a fascination for ring- and frequency-modulation harmony with the rhythmic energy and life of the folk music of his native Ecuador. His ensemble work *Monodias e Interludios* (1984) is a case in point: the spectra are generated purely instrumentally, with an unspecified 'bass-instrument' (double-bass, bass tuba, or some such) taking the role of a carrier frequency in FM synthesis, the changing spectra being provided to the nearest quarter-tone by the rest of the group. This is monophonic music: as the title indicates, Maiguashca has composed 'monodies' for sets of FM timbres and grouped them into lively melodic movements, each with its own distinctive character and sonorities. The acuteness of the composer's ear enables him to instrument his chosen spectra with such facility that the ear is deceived into hearing even quite complex and fast moving spectra as timbre, rather than simple 'chords.' Maiguashca managed a similar feat, this time combining real and simulated FM, in his attractive IRCAM commission *FMelodies* (1981) whose title again indicates his desire to infuse spectral composition with some melodic content.

This merits further thought: with certain notable exceptions, spectral composers have had a lot of trouble discovering ways to write

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11. *Editor's note:* the composer Clarence Barlow desires that his name be spelled differently with each use in print. The author of this article has respected that wish and therefore each re-iteration of the name is spelled differently: Baalo, Baaleuw, Baalow, etc. all refer to the same composer.

melodically, or for that matter polyphonically. One answer to this problem is to deny its existence altogether: supposedly such standard concepts as 'melody' and 'counterpoint' have ceased to have any meaning in the new syntax of spectral composition. This attitude certainly proved feasible for a while in the seventies, and a number of classic pieces were thereby produced: Grisey's *Partiels* and Murail's *Ethers* and *Gondwana* amongst them. But already in Grisey's *Modulations* a degree of melodic-cellular development proved necessary for textural variety, and Murail's *Memoire-Erosion* and *Les Courants de l'Espace* (1976 and 1979 respectively) also contained hints of melodic writing. Since the late eighties Murail's interest in 'meta-processes,' or processes consisting of several superimposed processes, has provided a means of polyphonic and enriched textural writing, and *L'Esprit des Dunes* (1994) bears witness to a wish to develop melodic formations from complex spectra. But melodic and linear writing remains untypical of this type of composing.

It is thus all the more surprising that several Feedback composers made repeated forays into melodic composition during this period. Aside from the work of Manguashca, it also plays a role in the music of Klarenz Baalo, Johannes Fritch and Peter Eotvos. Clarents Baarlough's *cogluotobüsisletmesi* (1980) is probably the best known, and certainly the most extreme product of the Feedback group. Not properly spectral music, it shares nonetheless a number of important concerns with spectral composition. An ambitious, half-hour composition for re-tuned piano, it betrays the (acknowledged) influence of the work of Partch and La Monte Young in exploring the rich possibilities of just intervals derived from the harmonic spectrum. Unlike Young's *The Well Tuned Piano*, only a few notes of the piano are re-tuned instead of the entire keyboard, to avoid 'a microtonal mush' as Baaleuw says. The resultant tuning is certainly easily memorizable, and an economic, effective way of redefining piano temperament in line with spectral needs; it's a device which has been used more recently in Grisey's *Vortex Temporum* (1996), in which again only a few keys of the piano are re-tuned, producing the frequencies common to all the spectra employed in the piece. In Baalow's case, however, the elements of spectral composition end there: his piano piece is an elaborate melodic, and later polyphonic monster, operating on several layers of processes at once — sometimes spread across the entire keyboard and, according to the composer, performable only by an 'ultra-virtuoso pianist.' (To date, Herbert Henck is the only pianist to have attempted the work; Baghlough later made a computer realization of the work at IRCAM, since no human performer can play all the pitches in the score.) Nevertheless, its concern for transforming constant and melodically simple music into highly dissonant polyphony reveals an obsession with auditively perceptible, directional processes closely anal-

ogous to the work of Grisey and Murail in the seventies. Balow pursued these explorations further in his ensemble piece *Im Januar am Nil* (1982).

Johannes Fritsch, a more orthodoxly spectral composer, made a typically 'Feedback' attempt to fuse melodic and spectral notions in several works, particularly his *String Quintet* (1984, composed in memory of Claude Vivier), as has Peter Eotvos in much of his music. Eotvos' ensemble piece *Sequences of the Wind* (1976) employs a set-up similar to that of Maiguashca's *Monodias*, with a tuba providing the equivalent of a carrier frequency to produce ring-modulation spectral melodies played by the rest of the ensemble, again tuned to the nearest quarter-tone. In the eighties he explored FM harmonic techniques to generate complex melodic or polyphonic strands of spectra in such works as his ambitious ensemble piece *A Chinese Opera* (1989). His *Intervalles Intérieurs* (1982), on the other hand, was a study in ring-modulation harmony and harmony derived from applying the Golden Section ratio to the frequency space, a largely textural essay more in line with the work of the composers from the group *L'Itinéraire*, for whom it was composed.

The emphasis on melody in the Feedback group may, of course, be another product of the heritage of Stockhausen. Certainly it played a crucial role in the music of the most currently played composer once associated with the Cologne circle, another Stockhausen pupil, the Canadian composer Claude Vivier (1948–1983). Vivier's music makes little pretense at resolving the difficulty of composing really polyphonic spectral music by not trying to do so. Virtually his entire mature output is essentially homophonic, and it is only with his output from 1980 onwards that we need concern ourselves here. Having absorbed the music of Bali and East Asia at first hand in the mid-seventies, Vivier developed a peculiarly original, direct melodic style, essentially diatonic and unashamedly naive, even childlike. His basic technique is simple: the melody was the first thing to be written; it was then provided, where deemed necessary, with a bass-line. The melody and the bass-line were then ring-modulated against each other to produce spectra which ranged from harmonic to non-harmonic according to the consonance or dissonance of the melody to its bass-line. The melody was also often doubled with its own harmonics, to enrich the texture, and all these factors combined with a strong preference for static, ritualistically block-like forms. Narrow though it may be, Vivier's music emanates an extraordinarily distinct atmosphere quite unlike any other composer. All the mature works involve the human voice, usually a soprano. The first piece to be written with these techniques was *Lonely Child* (1980) for soprano and orchestra, in which the composer says 'the entire orchestral mass is transformed into timbre...musically I had just one thing to master: this great spectrum of colors.' *Bouchara — Chanson d'Amour* (1981) for soprano and

ensemble, presents Vivier's technical procedures at their purest and most characteristic — the second section of the work presents a vivid example of Vivier's skill at composing with ring-modulation timbres: the orchestration sounds virtually electronic in its brightness and sheen. The last works show Vivier elaborating his field of action somewhat: *Prologue pour un Marco Polo* (1982) is his most complex work, a cantata for six voices, chamber orchestra and tape which makes some inroads into breaking up the homophony into multi-layered polyphony. This factor also comes into play in his last completed composition *Trois Airs Pour un Opéra Imaginaire* (1983) for soprano and fifteen instruments, a radiantly lyrical work composed for a commission from *L'Itinéraire*.

Aside from the above mentioned groups of composers, other activities through this period should be mentioned. At about the same time, a number of Romanian composers, whether in exile like Mioreanu or Radulescu, or native such as Niculescu, Stroe, Dumitrescu and Ioachimescu began to explore the parallel areas of research, linking the exploration of acoustics and spectra with the folk music of their home country (c.f. *Romanian Spectral Music*, in this volume). The Experimental Group of Hungarian Radio in Budapest, with which Eotvos was also associated and which included composers Zolton Jeney and Laszlo Sary, also explored acoustic links with composition, although their main area of interest was often elsewhere (much of their music is quite influenced by minimalism).

Several other independent figures emerged around this time: the German Erhard Grosskopf, still too little known outside his own country, is an interesting case of a composer who arrived at a spectral-type composition as a means of re-assessing consonance in the wake of the collapse of serialism. He generally works with loops of harmonic spectra as the pitch material for (largely) instrumental music. The effect, in his orchestral piece *Slow-Motion Sound* (1981, for koto and orchestra) or in his powerful *Quintett über den Herbstanfang* (1980), is of a richly varied harmonic vocabulary, swaying hauntingly between different complementary areas of simple or more complex verticalities with a nice mixture of inevitability and surprise. His most complex work, to date, employing these techniques is the ambitious orchestral ballet *Lightknall* (1986), and, like many of the composers in this volume, his instrumental writing has adopted a number of techniques directly influenced by studio procedures, such as spectral filtering, microtonal temperaments and, of course, the looping technique itself.

The music of Jonathan Harvey has developed steadily since 1970 towards a very personal form of spectral composition, often with the aid of electronics. His earliest music was in fact written using the strictest form of serial techniques (he studied for a while with Milton Babbitt). He made a number of attempts to combine this with his fascination with timbre, and

in such works as *Inner Light I* (1971) for ensemble and tape, or *Inner Light III* (1975) for orchestra and tape, he fused the two worlds successfully. In each case, the tape provides the means of bridging the gap between a serial, equally tempered universe and a spectral electronic one, dissolving the instrumental timbres and examining them under an aural microscope, as it were. With *Mortuos Plango, Vivos Voco* (1980), he produced a classic of computer music and probably the only serially composed spectral composition. The entire piece is based upon the Great Tenor bell in Winchester Cathedral. This was analyzed by computer, and the eight sections of the work are each based around one selected low partial in the bell spectrum; the duration of each section was determined by the frequency-proportions of these eight pitches. Furthermore, this sequence of eight pitches provides all the melodic material in the piece (the tape includes the singing of a boy's voice, that of Harvey's choirboy son). In short, every event, down to the smallest detail, can be deduced directly back to the bell spectrum and the eight pitches extracted from it. Curiously, for all its strictures of *écriture*, the piece sounds very free and spontaneous. More recently, in such pieces as *Advaya* (1994, for cello and electronics) and *Ashes Dance Back* (1997, for choir and electronics) Harvey has been inventing and exploring new ways of distorting, compressing and expanding spectra to provide his pitch material and formal principles.

Attempts, usually on the part of slightly older composers, to combine serialism and spectral techniques are found in figures other than Harvey. This is a feature of the music of Hugues Dufourt, influencing especially his chord-spacing and instrumentation in *La Tempesta* and *Saturne* (1977 and 1979 respectively). It is also a feature of the extroverted, energetic music of Canadian Gilles Tremblay (who taught Vivier, by the way). His piano concerto *Envoi* (1983) opens with a frenetic cadenza in which the soloist outlines the principle harmonic areas of the work; the piano texture is dissonant, complex and quite typical of post-serial composition. The cadenza is followed, however, by a long orchestral tutti in which all the piano's material is unwound, to reveal it as being comprised of superimposed harmonic spectra in the different registers of the orchestra: when fully superimposed, these spectra form a tense dissonance; examined one by one, they function as different plateaus of consonance, and the work unfolds as a dialogue between these two harmonic types.

### *The third phase: since the late eighties*

The last decade has witnessed a number of interesting developments, some of them quite unexpected. Spectral music has inevitably been disseminated more widely on the international scale, a factor which had

begun as early as 1980 with the invitation of Grisey and Murail to the Darmstadt Summer School, and the invitation of *L'Itinéraire* as a whole to the summer school in 1982, when the work of the Feedback composers was also featured (Fritsch's music was featured there in 1984, a year in which the work of Vivier was also presented; whilst Baló was featured every year since 1980). Through such exposure, and through the public advocacy of the late Olivier Messiaen, as well as energetic promotion on the part of the British composer George Benjamin, the music has attained acceptance and influenced a large number of composers in varying degrees. France has seen the emergence of the nearest thing to a 'school' of composers expanding and developing the researches of Grisey and Murail. Such pupils of theirs as Philippe Hurel, Marc-André Dalbavie, Jean-Luc Hervé and Joshua Fineberg have all exploited the latest technologies, often with recourse to IRCAM and with the encouragement of such prominent psycho-acousticians as Steve McAdams, exploring such crucial areas as perception and auditory event streaming.

The Finnish composer Kaija Saariaho has emerged in the last fifteen years as one of the best known spectrally-influenced composers of independent training and thought. She, too, has worked at IRCAM; while she never officially studied with either Murail or Grisey, she has readily admitted to their influence on her work (which nevertheless inhabits a quite different sound-world whose often fiercely bright sonorities betray the influence of Sibelius, as well). Her compatriot, Magnus Lindberg did study with Grisey in Paris, and also attended his seminars in Darmstadt. However, he simultaneously studied with Vinko Globokar, and his work up to 1987 betrayed no trace of spectral thinking, concentrating on what he termed a 'brutist futurist' instrumental vocabulary whose pitch-content was determined by a form of pitch-class set theory. Perhaps the single most surprising change of manner in recent years occurred ten years ago in Lindberg's output, when he began exploring ways of deducing harmonic spectra from dissonant material with the aid of technology at IRCAM. Since that point, he has developed a much more harmonically pellucid style, as exemplified in his explosive ensemble piece *Joy* (1989) which quickly became a contemporary classic. His interest in spectral techniques is mainly limited to this technique of 'consonizing dissonance' — he generally uses equal temperament and has avoided involvement with so-called 'complex sounds' such as FM spectra. As one of the most prominent composers anywhere on the current musical scene, he presents a valuable example of a composer who benefited from the liberating influence of spectral thinking, without hampering his personal style or becoming part of any 'sect.'

Although many of its composers are still very productive, there has been no apparent follow-up to the activities of the Feedback group in

Germany, where the musical scene has become very strongly dominated by the music and thought of Helmut Lachenmann, Wolfgang Rihm and Brian Ferneyhough, all of whom, in their different ways, stand at the opposite pole from spectral music from a technical and aesthetic point of view. In consequence, recent German music has developed along quite different lines, although some of the music of Hans Zender shows a personal development of renewed interest in spectral thinking (especially through ring- and frequency-modulation harmony). Similarly, aside from Jonathan Harvey and certain areas of the work of George Benjamin and Nigel Osborne, there has been no widespread British spectral movement. Rather, as with Lindberg, certain aspects which have appeared most stimulating to the imaginations of individual composers have made themselves discretely felt in their work — notably in their conceptions of timbre and harmony. The music of Richard Causton and Andrew Daniels are two fine examples of this, although neither would call themselves spectral.

The newer researches of Grisey and Murail are dealt with extensively in the second issue and I do not propose to touch on them here, beyond noting that most recent pieces of Grisey in particular have shown a very fresh and inventive approach to questions of meter, melody and polyphony which, as noted earlier, had previously proved elusive or remained unexplored. One of his most acclaimed pieces, *L'Îcône Paradoxale* (1996) shows these fresh discoveries that led Grisey in new expressive directions, undreamt of two decades before.

### *Postscript (personal)*

The future of this music is, at present, distinctly uncertain. With Murail's recent appointment at an American university (Columbia), one might expect the emergence of trends in American music showing the influence of his thought and practice. However, it is too early to comment upon this possibility. Much depends on the future of minimalism and neotonality as commercial forces; as long as these options remain economically attractive for composers, publishers and record companies, there will continue to be many adherents to these styles of composition (besides those properly inclined towards them). The true originals of these styles like Reich or Andriessen, may thus remain the exception rather than the rule.

Minimalism has shown that the extreme limitation of musical vocabulary need not impede the music's reception by the general public. Yet, it is sad to report that to many people, outside the immediate circle, spectral music has remained more interesting as passing sound colors than as

a substantial musical technique. This impression is no doubt reinforced by the fact that the opportunities to hear much of this music are too scarce for proper assessment. Indeed its influence upon such figures as Lindberg, Harvey or to a lesser extent Vivier, has demonstrated that it can be readily assimilated as this type of passing color within a slightly broader musical style. If it is to have a more lasting impact than that, however, the music must get into the hands of more performers, ensembles, orchestras, and, above all, reach the ears of the general public.