allows greater nuance and refinement of details, and magnetic tape permits as many takes as necessary. Moreover, with the arrival of stereo, Legge rethought the recording of opera as an endeavour requiring its own kind of staging, with due care for the way that the acoustic space was arranged (although he never went as far as John Culshaw at Decca, who made his name by using cinematic sound effects in the first complete recording of Wagner's *Ring* cycle). Encouraged by Legge, says Kesting, the studio recordings allowed Callas to cultivate the smallest vocal nuances, the finest inflections. According to the writer Ingeborg Bachmann, Callas had a unique way of pronouncing words 'and the record is the ideal medium for the art of sound play'.[50] The result was a *mise-en-scène* conceived in acoustic terms, a virtual space which was enhanced by stereophonic sound, a music theatre without a stage.

It is somewhat ironic to discover that the fashion icon adopted by Callas on which to model her image was that of a film star. Zeffirelli reported that during rehearsals for a Rossini opera in 1955, Callas saw *Roman Holiday*, and told him she wanted to look 'as fine and delicate' as Audrey Hepburn. The two had once met – they shared the same cosmetician in Paris – and Callas had said the same thing to Hepburn herself, much to the film star's amazement.[51] The incident only underlines a paradox: what Callas achieves through the medium of the recording continues to thrill, and no other singer has yet come near to the same qualities. Yet at the same time, for anyone who saw Callas on stage, the recording remains an *aide-mémoire* which merely evokes the memory of an extraordinary dramatic presence. It is remarkable enough that her magnetism was larger than her voice, so that even her late performances, when her voice was overstretched and sometimes awkward, remain more powerful in the memory than performances by others, however perfectly sung. The real meaning of this paradox is discovered in recordings of roles that she never performed on stage, that nobody has seen, but that no singer since has been able to match.

8

The Record and the Mix

Between the photograph and the sound recording, photography and phonography, there is both an affinity and a critical but elusive difference. It did not need photography to show people what they looked like – the image itself might surprise them, but not the fact of a visual representation, which everyone knows from reflections and mirrors, let alone human artistry in the form of drawing and portraiture. In this sense, the objective automatism of photography may be thought of as the fulfilment of aims that visual art had long entertained. But Edison, speaking of hearing the first recording he ever made, remarked 'I was never so taken aback in my life.' For no one before this moment could know what their voice sounded like. It is *still* always surprising when anyone hears their own recorded voice played back for the first time, for as Malraux once said, 'You hear other people in the ears, but your own voice in the throat.' Phonography wrested the voice from the throat and embedded it, like an echo, in a mechanical memory.[1]

Edison spoke of 'phonographing a sound', on the linguistic model of 'photographing a scene', and for decades people thought of sound recording as a kind of sound photography, meaning a technique, despite the fact that photography was recognized to be an art. Of course, as Benjamin wrote, a lot of futile thought was devoted to the question of whether it *was* an art. 'The primary question – whether the very invention of photography had not transformed the entire nature of art – was not raised.'[2] It is curious that the title of the essay containing this observation, 'The Work of Art in the Age of Mechanical Reproduction', evokes the phonographic reproduction of music, when in fact the essay deals principally with the

photographic art of film – as if Benjamin thought of phonography as the paradigm of a radically new aesthetic effect, with momentous consequences for cultural attitudes, but could only analyse the process in terms of an art form that was representational.

There is a semiological puzzle here, concerning the nature of the representational sign. The automatism of the process in both media, photography and phonography, guarantees a causal relation between the signified and the signifier. In both cases, the signifier belongs to the type of sign that the American philosopher C.S. Peirce called an index – like thunder and lightning or smoke and fire – where the one is causally linked to the other. If it were true, then, that the camera cannot lie, then nor can the tape recorder. (On this reading it is not the machine which lies when the representation is mendacious, but the human being who uses it.) But the photograph is also what Peirce called an icon, the kind of signifier which represents the signified by means of a similar arrangement of certain features: a 'fitness' of resemblance, like a drawing or a map. The photograph is thus both an index and an icon at the same time. The recording process would seem analogous but is subtly different. There is no equivalent, for example, to the photographic negative, as if the recording does not so much copy the original sound as recreate it. The coded tracings which are nowadays a familiar image are not the same. Precisely what people found surprising about the record groove was that such a mechanical tracing could contain the vibrant world of sound at all.

Phonography is therefore not like taking a photograph after all. Moreover, if the reproduction of a scene in photography is a logical property of the medium, in the process, non-artistic or even unartistic objects are fashioned by the medium into artistic representations (and in the medium of film, these representations are cut up and reassembled to produce the art of dramatic montage). In phonography, however, as long conceived, such artistic ideas were shut out; the purely documentary vocation of the medium, its mimetic objectivity, completely predominated. And in its most naïve form – as if photography and film had not turned documentary into a highly poetic artistic genre. As Douglas Kahn, an American audio artist, puts it, 'Art photography is commonplace, but an art phonography? When compared to the photographic arts, the phonographic arts are retarded.'[3]

'Audio artist' is a term that signifies a new moment in phonographic culture, a new kind of artistic endeavour, belonging to the 1980s alongside

the rise in performance art and installation art; in fact it is one of the links between the two, since audio technology allows sound signals to be incorporated into both. Let us define it for the moment as an art of sonic montage, something like a cross between experimental radio and *musique concrète*. It is also a movement in the interstices of mass communications, in the form, among other things, of mail-order audio cassettes. And according to Kahn, it has been a long time coming.

The reasons for the delay are not just technical – the ease of access and operation of the new gear in comparison to the earlier – but also institutional and aesthetic. There were individual experiments and proposals between the wars by artists of the avant-garde like the photographer Moholy-Nagy or the film-maker Dziga Vertov, as well as by a number of composers, like Milhaud and Cage – although Kahn insists that audio art is not primarily, or even essentially, musical. Later would come a few small spaces provided by the cultural channels of public service radio stations for essays in the form of experimental drama. The central artistic problem that they all faced was the weight of the documentary status of the recorded sound, the vocation of the recording for overt mimesis: its dogged faithfulness to the original, its empirical matter-of-factness. This is a capacity for copying which phonography shares with photography but hardly at all with music. (Which is not to say that there is no imitative music, just as there are onomatopoeic words, but rather that the ability of music to imitate non-musical sound is marginal to its primary mode of expression.) But phonography had been captured by music and non- or extra-musical uses were marginalized and downgraded. (Edison's notions about recording the dying for posterity, for example, were totally ignored by the record companies. The idea of a historical archive was none of their business; the notion belongs to the newsreel or broadcasting.) In short, the absence of an art of mimetic sound is the converse, says Kahn, of the presence of music as the universal art of sound. Audio art can only arise when this is acknowledged and then worked upon, to produce a sonic equivalent to the visual poetry of photography and film; a process that includes the creative distortion of the sound image.

Raw sound too, which interests the audio artist for a variety of reasons, is also musically alien. It seemed inescapable that if non-musical sounds were to acquire the potential of becoming artistic symbols, then by the same count they became music – unless music were to change. Kahn

considers audio art, though composed, as something different from music, but it needed the work of composers like John Cage, who did things with noise, to challenge the ingrained habits of musical hearing and open up our ears. In this the relationship with noise is critical.

The first intimations of a new attitude towards noise occurred well into the age of the phonograph but were strangely independent of it. The immediate inspiration for Russolo's noise instruments, which he presented at concerts in Milan, Paris and London in 1913, came from fellow Italian Futurists like Marinetti, for whom noise signalled the ascendancy of the modern age. Sound is defined (wrote Russolo) as the result of a succession of regular and periodic vibrations, while noise is caused by irregular motion. But the distinction is not a sharp one.

> We know that the production of sound requires not only that a body vibrate regularly but also that these vibrations persist in the auditory nerve until the following vibration has arrived, so that the periodic vibrations blend to form a continuous musical sound. At least sixteen vibrations per second are needed for this. Now, if I succeed in producing a *noise* with this speed...

Hence the rectangular wooden boxes which made up the Futurist Orchestra, containing mechanisms turned by a handle to produce a remarkable variety of distinguishable noises. (This music has now been released on CD and begun to circulate afresh.)

In the 1930s, composers as diverse as Milhaud, Hindemith, Varèse and John Cage had all experimented with discs played on variable speed turntables to create striking, though limited, transformations of sound. Cage, as a student in Schoenberg's composition class at UCLA in the mid 1930s, realized he had little talent for harmony. According to one story, Schoenberg declared that he was no composer, but an inventor of genius. The prediction was borne out in the invention of the prepared piano and the composition between 1939 and 1952 of the series called *Imaginary Landscapes*, using novel combinations of percussion and electrics: turntables playing frequency test records, contact microphones made from electric guitar pickups, and so forth. The most notorious was No. 4 for twelve radios, dating from 1951. Pierre Schaeffer, a radio sound technician in Paris, began to experiment in 'scratching' records during the war and by 1948 had formu-

lated a method of composition which freed the sonic material from association with its origins. Taking sounds from different sources, from pianos to railway trains, he produced a series of short pieces by playing them at different speeds, forwards or in reverse, isolating fragments and superimposing them. This was *musique concrète* – concrete music as opposed to music made by putting notes on paper – and by the early 1950s Schaeffer had attracted around him a group of young musicians keen to know more, including Messiaen and his pupils Boulez and Stockhausen.

Musique concrète came of age with the introduction of the tape recorder, which allowed precise control over the techniques that Schaeffer developed on the turntable. Kahn points out that, technologically speaking, Schaeffer's first works could have been produced on similar equipment available much earlier in the form of the optical film soundtrack. Optical sound equipment was used already in the late 1920s in Germany by the experimental film-maker Walter Ruttman and others to produce radio works, and the Russian film-maker G. V. Alexandrov experimented with techniques later associated with *musique concrète* in an experimental film of the same period, such as running the sound backwards and cutting it up. And of course, these techniques are also those of film editing.

Rudolf Arnheim, in his 1930s book on radio, lamented the lack of a radio art taking advantage of the new resources. Such artistry developed, however, in cinema, especially in the domain of animation, where it seemed to be encouraged by the absence of objective reality in the image. The pioneers were experimental film-makers like Norman McLaren in New York and the Whitney brothers in Los Angeles, who scratched and manipulated the soundtrack itself (as Alexandrov also did). Working under a different sign, in RCA's sound film operations in Hollywood in 1936, a certain Frederick Samnis dreamed of an apparatus that would automate much of this work, a photoelectric 'Singing Keyboard', using loops of optical sound film. Intended as 'a special purpose instrument for making "talkie" cartoons', it would have 'ten or more sound tracks ... featuring such words as "quack" for a duck, "meow" for a cat, "moo" for a cow ... It could as well be the bark of a dog ... or the twaddle indulged in by some of our tin pan alley song writers.'[4] Other people designed machines called the Noisegraph, the Dramagraph, the Kinematophone, the Soundograph or the Excelsior Sound Effect Cabinet. Some of these instruments employed discs, like Edwin Welte's Lichttonorgel, in which

photoelectric recordings of famous European pipe organs were inscribed in concentric circles on a disc made of glass. Today, this kind of machine is called a sampler, and it employs the most advanced computer technology.

If the sampler was first put to work in the Hollywood cartoon, tape editing copied techniques developed by the film editor. Nor was it the commercial recording studio where these techniques were first applied to music but the electronic music studio, which amalgamated the techniques of *musique concrète* with combinations of acoustic tones produced by assorted electronic signal generators. Radio stations were the first centres of research and experiment in electronic music, and different schools of thought quickly began to emerge about what this new kind of music could do. The first dedicated electronic music studio in Germany was set up at the radio station in Cologne by Herbert Eimert, where he was joined in 1952 by Stockhausen; here they set out to create not *musique concrète* but electronic music proper, in which 'natural' (i.e. recorded) sounds were taboo. Pretty soon Stockhausen started to incorporate them anyway, and in Italy in 1955 Luciano Berio and Bruno Maderna set up a studio at a radio station in Milan which brought the two compositional principles together from the outset.

The results — the creation of entirely novel sonic landscapes — were broadcast on the cultural radio stations and played in small concert halls. The Dutch firm of Philips, Europe's leading electronics enterprise, commissioned the veteran avant-garde composer Edgar Varèse to create a work to be played in their pavilion at the 1958 Brussels World Exhibition, designed by Le Corbusier and equipped with 350 loudspeakers. But the wider impact came when the works that these composers produced were issued on record. They were released in small editions for aficionados of the avant-garde, but as Eimert put it, it made you wonder 'whether perhaps it is not the symphony recorded on tape or disc that is the synthetic, and electronic music the genuine article'.[5] In short, these were the first recordings that seemed to be composed for the medium, rather than the medium transparently reproducing them. What is more, being records, they began to spread beyond their immediate market and exert their influence undetected, until the media began to report stories such as that of Paul McCartney, between making *Revolver* and *Sgt. Pepper*, listening to Stockhausen.

<center>★</center>

Revolver, released in 1966, had already used backward tapes and splicing techniques derived from *musique concrète* and the electronic music studio. Before *Sgt. Pepper* was released in 1967, the Beatles quit touring and declared themselves a studio band. Paul McCartney announced that the Beatles were not only working on new songs but new sounds, and all was ready for *Sgt. Pepper* to be received as the first of a new kind of studio rock album, composed for recording rather than performance. As the Beatles were then in their heyday, these two albums became the pivot of a new brand of 'art rock', a genre that evolved along with the stereo LP. Established exponents of the style like Yes, Electric Light Orchestra and King Crimson concentrated on incorporating classical music styles into a popular music form. The new emphasis, with champions like the Steve Miller Band, Pink Floyd and Jimi Hendrix, was on the incorporation of experimentation with sound.

Sgt. Pepper could not have been created without a four-track tape recorder, but the Beatles were not the first popular recording artists to use these techniques, which had already cropped up on so-called novelty numbers during the 1950s. More importantly, they shared the credit for these albums with George Martin, marking in the process the emergence of a new kind of popular record producer.

Rock 'n' roll had changed the job of the producer. Not only had the corporate A&R man been eclipsed by the rise of the independents, but the producer's function had altered because rock musicians brought their own material with them — that was part of the deal: they either wrote or chose it themselves. (Creative cover versions, like 'Roll Over Beethoven', first recorded by Chuck Berry for Chess in 1955, re-recorded by the Beatles eleven years later, were becoming part of the pop tradition; other groups like the Rolling Stones and the Who also attracted attention at the beginning of their careers by demonstrating their ability to take a minor hit by an American rock 'n' roll artist and turn it into a major one.) In this respect the Beatles were true to type, though untypically celebrated for their musical originality — and not just by the pop world: distinguished music critics analysed their songs and pointed to novel constructions of melody and harmony. The sound they projected in the studio, however, was not achieved merely by musical magic. With increasing possibilities for moulding the sound, a producer like Martin, who knew what he was doing, could begin to 'direct' the musicians; not so much like a

conductor in front of an orchestra, but as if they were making a film, not a record.

Or as if the studio had become a huge musical instrument at the producer's disposal. The redesign of the studio following the introduction of tape had stimulated the development of a whole series of different pieces of processing equipment – delay lines and reverberation units, equalizers, filters, compressors and limiters. At the same time, hand in hand with stereo came the introduction of the multitrack tape recorder: the first four-channel tape recorders were introduced in 1958; eight- and sixteen-track recorders were available by the late 1960s. At this point pop music became a new form of musical manufacture. Where direct recording – to disc or tape – relies on microphone placement, equalization, acoustics and mixing *before* recording, multitrack recording allows mixing to take place afterwards. It also allows overdubbing, by which different musical parts can be recorded at different times on parallel tracks, and a process of re-recording evolves, known as mixing down or remixing, which combines the different parallel tracks into a single master version. Overdubbing was not a new technique. The original form of the practice was achieved on single-track tape recorders by re-recording from one deck to another while adding in another live recording at the same time, but it was not until multitrack recorders that it became anything like standard practice.

As these techniques developed, a new generation of independent producers emerged, who would team up with a favourite engineer and particular artists and groups and take charge of them in the studio (thus helping to keep the confused executives of the record company away). At the same time, musicians no longer needed to be fully rehearsed when they went into the studio, but could use the studio in order to 'compose' as they went along. Since multitrack recording also allowed for easy 'punch-ins' – re-recording parts of individual tracks on top of what is already there – they could also spend a good deal of time correcting mistakes. Before multitracking, the objective was to do a series of takes until you had enough to be able to assemble a definitive version with editing, by splicing sections of each together. When multiple tracks are recorded on the same tape, it is no longer safe to splice it, so punching-in takes over. By the same token, however, the essential activity of the musician, the performance of music, becomes more and more fragmented.

As musicians, engineers and producers became ever more involved in

different facets of the recording process, two things happened: authorship became diffused, and uncertainty in the relations of production led to power struggles for aesthetic control of the finished product; as one writer puts it, 'their titles [become] as problematic as their job descriptions'.[6] George Martin, by all accounts, was completely unlike this. He was a creative collaborator, who had learned the craft of the record producer in the 1950s, among other things working on records by the American bandleader and drummer Spike Jones, famous for his musical humour. Recording allowed Jones to add sound effects to the unorthodox instruments he used in live performance, like washboards and automobile pumps. Martin brought to recording the Beatles the same spirit of technical experiment, and something of the same sense of humour.

This process of fragmentation is one of the keys to the development of commercial popular music over the past fifty years. It induces a simplification of musical elements, a reduction in musical complexity, since the artist is relieved of the need to master anything more than basic skills. This does not of course mean a reduction in potency, but its concentration in a limited range of rhythmic, melodic and harmonic gestures. The procedure originates in the practices of Tin Pan Alley, and it is not the purpose of this kind of music to yield enduring aesthetic riches but to be eminently consumable and readily disposable. But if this, as Adorno considered, is artistic trash, catering to certain social predispositions in the listener, then the aesthetic judgement that is made on it must take into account that trash has now become an artistic category.

Mixing, says Steve Jones in *Rock Formation*, is what distinguishes popular music from classical music, citing the comments of a recording engineer who has worked in both fields and has won Grammy awards for recordings by the likes of Quincy Jones and Michael Jackson. Speaking in 1987, Bruce Swedien explained:

> When I started recording classical music (I worked for RCA in Chicago, my gig was recording the Chicago Orchestra) I soon began to feel as if I was taking dictation, or something. In other words, the most that I could do in recording classical music was to re-create the original sound-field. On the other hand, in pop music (all types, rock, R&B, etc.), the only thing that limits the sound

image that we create is our own imagination. Mix up those reverb formats, get crazy, don't try to rationalize anything.[7]

The new recording techniques raised the status of producers and engineers in both classical and popular music, but not to the same degree. Royalties for producers became common in popular music, but as one classical record producer puts it, 'were never considered in the field of "serious" music, for the simple reason that nobody in management had even the remotest idea what classical producers actually did'.[8] In popular music the producer, whatever he did, clearly held the secret of success; in classical music the aim was the transparent rendition of a natural musical object. Opera was the height of the art because here the record could become a theatre of the imagination. However, the classical record producer preferred to speak not of mixing but of balance. The object was to achieve an aural image something like the sound perspective that might be heard from the middle of the stalls in one of the great concert halls like the Concertgebouw in Amsterdam or the Boston Symphony, or a top-price seat at La Scala, Covent Garden or Bayreuth, all of which have splendid (though different) acoustics. The skill of the engineer is partly concerned with how to achieve this kind of balance in less compliant acoustics. This whole approach is irrelevant in the case of pop music, because there is no comparable kind of space where the music originates. Indeed the gramophone itself has rendered popular music a product of loudspeakers which may be located anywhere, where they often have to compete with other sounds and noises. The ultimate aim is therefore to produce the most effective sound for reproduction of different kinds, from the jukebox and domestic record player to the car stereo and portable earphone player, which each make their own acoustic demands.

A history of mixing would include the effect credited to the Los Angeles producer Phil Spector in the early 1960s, known as the 'wall of sound'. Here, according to one account, the basic ingredients included generous instrumentation, like orchestral strings or blazing brass, underpinned by prominent percussion playing insistent rhythms, intensified by the use of echo and tape loops. In particular, the 'wall' effect was achieved by a mix which placed equal value on the disparate elements that went into it. 'The voice was another instrument, equal in value with the third tambourine, not lost in the mix, but not placed far in front of everything else.'[9]

Eisenberg, in *The Recording Angel*, considers Phil Spector to be 'the first *auteur* among producers', whose work was 'perhaps the first fully self-conscious phonography in the popular field', with an immense influence on his musical betters, from Brian Wilson of the Beach Boys to the Beatles and Frank Zappa.[10] The Beach Boys rapidly became a group whose essential sound was a function of studio recording, a combination of vocals, heavily multitracked, and studio effects, which included electronic keyboards for the underlying motor rhythm.

Multitracking adds a new dimension to mixing. Prior to the multitrack tape recorder, mixing was done in the process of recording the performer. That is, the sounds from the microphone were treated by equalization, reverberation and other effects, then sent to the tape head. Multitrack recorders allowed mixing after recording, by isolating each instrument on its own track, either by placing baffles between them in the studio or by recording them separately. These innovations affect musicians directly. Musicians who have to record in this way now need headphones to hear themselves and each other, even when they are playing together in the same studio.

The rock critic Simon Frith has argued that tape recording allowed producers and engineers to manipulate performances in the same way that it allowed musicians to manipulate sound. With multitrack recording, not only could parts of different takes be edited together but individual parts could be altered without changing others played alongside. Each track can be manipulated separately; different effects can be added; the tracks can then be recombined and balanced with other tracks and the final mix sent to another recorder. As a result, multitrack recording puts the producer and recording engineer firmly in charge of the studio, but it also creates new musical possibilities; the new mode of production therefore begins to turn the recording engineer – the mixer – into a musical creator of a new kind.

Mixers now came to be in as much demand as producers (and some played both roles) and their artistry expanded. Indeed, as one writer puts it, the remix 'is a unique artistic act whose artistry is produced through the technology' since the craft is in manipulating both the music and the *sound*. Remixing is 'recoding, the reanimation of familiar music by the creation of new sonic textures for different sonic contexts'.[11] For this very reason, new demands emerge to adapt the mix to the acoustic criteria of

different reproduction systems. This was true even in the early 1950s. A report in *Newsweek* in 1952 called 'Men Behind the Microphones' explained that records were made 'with a slight but deliberate distortion: the volume of high frequency tones is boosted. This step is taken to override needle hiss, which is a melange of high frequency noise. Phonographs are supposed to be designed to compensate for this distortion by automatically suppressing high tones. The net result, ideally, is balanced tone with reduced needle noise.'[12] By the 1980s, the history of mixing has ended up in the practice of mastering different versions of the mix for different media, and as Steve Jones puts it, the final mix is not the final product. Often several versions of a song will be released, 'one for each format; a short mix for AM radio, a longer more elaborate mix for FM radio, a long mix with many effects and edits added for dance clubs, and a version of the FM radio mix with effects and "sweetening" added specifically for combining the song with a video'.[13]

The remix has also given birth to new genres. According to one account, the development of reggae is an example. Recording engineers, says Dick Hebdige in *Cut 'n' Mix*, experimented by mixing the tracks together on the final tape in different ways. 'For instance, ska and rocksteady records were mixed differently. In ska, the vocal track had been given prominence ... but on the new rocksteady records, the singers' voices tended to be treated like any other instrument.' Pride of place was given instead to the 'dread ridims' of the bass guitar.[14]

But this is not just a question of different musical genres. What is going on, which motivates the music, is part of a wider history, that of a series of encounters between the electrification of music and cultural traditions not so much outside as at the edges of the commercial mainstream; a process driven by the record industry's need to incorporate new markets. Since the 1920s, this had largely meant black American music, in the forms of jazz, blues, and rhythm and blues. By the 1970s, the edges of this zone came to include the English-speaking Caribbean, and especially Jamaica. The result is a musical history that leads back to the practice of 'toasting', which is found at the roots of reggae, and forwards to rap, born in the hip-hop culture of urban black American youth, like the New York discos, where disc jockeys would talk to their audiences in the jive style of the old personality DJs.

In short, rap is the music of the DJ, the music that the DJ makes by

rhythmically combining his voice with recorded sounds, which finds its origins, according to several writers, in Afro-American oral traditions; like reggae, where it is possible to hear echoes of old African boast songs. But the more immediate reference point is 'toasting', or talking to a rhythm in a patois, where the rhythm of the speech and the rhythm of the beat work together, a verbal style which was first married to rhythm and blues by Jamaican disco DJs. As Dick Hebdige recounts, Jamaican interest in American black music, fuelled especially by R&B stations in Florida, prompted the appearance of discotheques – large dances, indoor or outdoor, employing powerful sound systems incorporating microphones for the DJ who operated them, who not only presented the records but talked over them. They would 'add spice' to the records they were playing, says Hebdige, 'by shouting out their favourite catchphrases over the microphone. These talkovers or toasts soon became a popular feature of the blues dances.'[15] Soon, he adds, the DJs were also adding electronic sound effects like echo and reverberation, and by the end of the 1960s the first talkover records had begun to appear. These records combined the DJ's patter with a mixing technique known as dub, which consisted in using prerecorded tracks to create pulsating rhythms, distorting the original in the process in such a way that the tune is still recognizable but heavily broken up by the insistent emphasis on the drums and the bass. The technique crystallized in the records of the first talkover star, U Roy, in 1970. In Hebdige's description, 'He would take a popular rhythm track, phase out the singing and add his own stream of screeches, yelps and muttered catchphrases. The records were an immediate success...'[16]

Dub and talkover records became extremely popular with fans, but not with musicians. Jamaican radio, Hebdige tells us, was forced to ban them because of pressure from the musicians' union. The union was indignant that the musicians who recorded the original tracks of which these records made use, did not get any royalties. As one Jamaican record producer put it, 'You can copyright a song, but you can't copyright a rhythm.' But another says, 'It's not like we stealing anything from anybody. We take a ridim and update it and re-record it. And then we apply our new ideas to it. We call it 'anointing' the ridim with our own magic.'[17]

The ban – and the mixers' denial that they were violating anyone's property rights – signals the emergence of a radical new state of affairs in commercial popular music. This is not just a new kind of sound or even

a new musical style, but a transformation of music, in which the 'misuse' of music becomes a new norm. The music is rough and crude, another result of a process that sees the reduction of musical content to the most basic elements, but here in a synthetic form. As Steve Jones observes, 'Many dub reggae recordings from the early 1970s, recorded on low quality equipment, contain examples of tape hiss boosted at rhythmic intervals to sound as if the hiss was part of the music.'[18] But dub and talkover records are not so much recordings composed for the medium, like the studio albums of art rock groups, they are rather composed out of it. And they become a kind of *musique concrète*, the creative distortion of the sound image using recorded musical materials as sonic objects. Naturally it is a kind of music that belongs to a very different idiom from that of the trained composer, for here, without access to the sophisticated electronics of the avant-garde composer's studio, popular artists are making music without any traditional instrument except the voice.

Rap artists take this a step further, turning mass-produced replay equipment into their instruments. All a rap band needs is a dual turntable, a drum machine if they can afford it, and a microphone. The method, which is simple, though requiring considerable dexterity, involves scratching the discs on the turntable, manipulating them to produce their own rhythmic sound. This is, of course, another fundamental example of misuse, a transgression of the normal purpose for which turntables and needles and records are designed. The result is a form that foregrounds fracture and disruption. As a description in a book on the subject, called *Microphone Fiends*, puts it, rappers call out to the DJ to 'lay down the beat' which it is expected will be interrupted. 'The flow and motion of the initial bass or drum line in rap music is abruptly ruptured by scratching ... or the rhythmic flow is interrupted by other musical passages.'[19] In short, according to another writer in the same book, materially deprived and culturally despised youths have seized on the products of advanced technology for their own purposes. They have combined some of the oldest African–American oral traditions with some of the newest technological gadgetry. 'Defamed and despised ... they [have] found a way to contest their erasure, to reintroduce themselves to the public by "throwing out" a new style that made other people take notice...'[20]

9

Global Corporations

and 'World Music'

Reproduction has produced the unhappy effects on musical perception of disembodiment and the destruction of what Walter Benjamin called the traditional aura of the artwork. The record industry has stimulated the formation of an enormous production sector of trite ephemera which damages musical sensibilities, if not our very ears. The musical world, like the cultural ethos that envelops it and to which it makes a major contribution, has been transformed. On the one hand, reproduction makes *all* music equally worn out and done to death; on the other, with the multiplication of media and the means of replication, the mechanism of the market has itself created a condition in which all music circulates more and more freely beyond its control – as *musica practica* has always done. In the new phase which develops by stages in the second half of the century, reproduction and the equipment associated with it begin to constitute a parallel agency of cultural production alongside traditional *musica practica*, and accordingly reproduction nurtures new creative potential of its own. And because this involves the increasing technification of musical production, this potential in turn extends the attack on the old traditions, while the endlessly expanding circle of consumption and reproduction throws everything back into play. This is the condition that has been dubbed postmodernism, in which the echoing imitation, instead of dying away, gets louder.

To be sure, as Adorno says, exchange value exerts its power in a special way in the realm of cultural goods like music. Since the very quintessence of the aesthetic effect hangs on the thread of illusion, the artistic product, even the quasi-artistic, appears to be uniquely exempt within the world of

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35. John Culshaw, *Putting the Record Straight*, Secker & Warburg, London 1981, p. 69.

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39. Carpentier, p. 270.

40. Culshaw, *Putting the Record Straight*, p. 164.

41. Quoted in Steve Jones, p. 178.

42. Leonard Warren cited in 'Recording in Italy', *Time*, 29 July 1957.

43. Gould, p. 337.

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48. Kesting.

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8 The Record and the Mix

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20. George Lipsitz, 'We Know What Time It Is', in Ross and Rose, p. 20.

9 Global Corporations and 'World Music'

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