

= Noise in music =

In music , noise is variously described as unpitched , indeterminate , uncontrolled , loud , unmusical , or unwanted sound . Noise is an important component of the sound of the human voice and all musical instruments , particularly in unpitched percussion instruments and electric guitars (using distortion) . Electronic instruments create various colours of noise . Traditional uses of noise are unrestricted , using all the frequencies associated with pitch and timbre , such as the white noise component of a drum roll on a snare drum , or the transients present in the prefix of the sounds of some organ pipes .

The influence of modernism in the early 20th century lead composers such as Edgar Varese to explore the use of noise @-@ based sonorities in an orchestral setting . In the same period the Italian Futurist Luigi Russolo created a " noise orchestra " using instruments he called intonarumori . Later in the 20th century the term noise music came to refer to works consisting primarily of noise @-@ based sound .

In more general usage , noise is any unwanted sound or signal . In this sense , even sounds that would be perceived as musically ordinary in another context become noise if they interfere with the reception of a message desired by the receiver . Prevention and reduction of unwanted sound , from tape hiss to squeaking bass drum pedals , is important in many musical pursuits , but noise is also used creatively in many ways , and in some way in nearly all genres .

= = Definition of noise = =

In conventional musical practices sounds that are considered unmusical tend to be treated as noise . Oscillations and Waves defines noise as irregular vibrations of an object , in contrast to the periodical , patterned structure of music . More broadly , electrical engineering professor Bart Kosko in the introductory chapter of his book Noise defines noise as a " signal we don 't like . " Paul Hegarty , a lecturer and noise musician , likewise assigns a subjective value to noise , writing that " noise is a judgment , a social one , based on unacceptability , the breaking of norms and a fear of violence . " Composer and music educator R. Murray Schafer divided noise into four categories : Unwanted noise , unmusical sound , any loud system , and a disturbance in any signaling system .

In regard to what is noise as opposed to music , Robert Fink in The Origin of Music : A Theory of the Universal Development of Music claims that while cultural theories view the difference between noise and music as purely the result of social forces , habit , and custom , " everywhere in history we see man making some selections of some sounds as noise , certain other sounds as music , and in the overall development of all cultures , this distinction is made around the same sounds . " However , musicologist Jean @-@ Jacques Nattiez considers the difference between noise and music nebulous , explaining that " The border between music and noise is always culturally defined ? which implies that , even within a single society , this border does not always pass through the same place ; in short , there is rarely a consensus ... By all accounts there is no single and intercultural universal concept defining what music might be . "

= = Noise as a feature of music = =

Musical tones produced by the human voice and all acoustical musical instruments incorporate noises in varying degrees . Most consonants in human speech (e.g. , the sounds of f , v , s , z , both voiced and unvoiced th , Scottish and German ch) are characterised by distinctive noises , and even vowels are not entirely noise free . Wind instruments include the whizzing or hissing sounds of air breaking against the edges of the mouthpiece , while bowed instruments produce audible rubbing noises that contribute , when the instrument is poor or the player unskilful , to what is perceived as a poor tone . When they are not excessive , listeners " make themselves deaf " to these noises by ignoring them .

= = = Unpitched percussion = = =

Many unpitched percussion instruments , such as the snare drum or maracas , make use of the presence of random sounds or noise to produce a sound without any perceived pitch . See timbre . Unpitched percussion is typically used to maintain a rhythm or to provide accents , and its sounds are unrelated to the melody and harmony of the music . Within the orchestra unpitched percussion is termed auxiliary percussion , and this subsection of the percussion section includes all unpitched instruments of the orchestra no matter how they are played , for example the pea whistle and siren .

== Traditional music ==

=== Antiquity ===

Although percussion instruments were generally rather unimportant in ancient Greek music , two exceptions were in dance music and ritual music of orgiastic cults . The former required instruments providing a sharply defined rhythm , particularly krotala (clappers with a dry , nonresonant sound) and kymbala (similar to finger @-@ cymbals) . The cult rituals required more exciting noises , such as those produced by drums , cymbals , jingles , and the rhombos (bull @-@ roarer) , which produced a demonic roaring noise particularly important to the ceremonies of the priests of Cybele . Athenaeus (The Deipnosophists xiv.38) quotes a passage from a now @-@ lost play , Semele , by Diogenes the Tragedian , describing an all @-@ percussion accompaniment to some of these rites :

And now I hear the turban @-@ wearing women ,
Votaries of th ' Asiatic Cybele ,
The wealthy Phrygians ' daughters , loudly sounding
With drums , and rhombs , and brazen @-@ clashing cymbals ,
Their hands in concert striking on each other ,
Pour forth a wise and healing hymn to the gods .

An altogether darker picture of the function of this noise music is painted by Livy in Ab urbe condita xxxix.8 ? 10 , written in the late first century BC . He describes " a Greek of mean condition ... a low operator in sacrifices , and a soothsayer ... a teacher of secret mysteries " who imported to Etruria and then to Rome a Dionysian cult which attracted a large following . All manner of debaucheries were practised by this cult , including rape and

secret murders ... [where] the bodies could not even be found for burial . Many of their audacious deeds were brought about by treachery , but most of them by force , and this force was concealed by loud shouting , and the noise of drums and cymbals , so that none of the cries uttered by the persons suffering violation or murder could be heard abroad .

=== Polynesia ===

A Tahitian traditional dance genre dating back to before the first contact with European explorers is ??te?a , danced by a group of men accompanied solely by a drum ensemble . The drums consist of a slit @-@ log drum called t? ? ere (which provides the main rhythmic pattern) , a single @-@ headed upright drum called fa ? atete , a single @-@ headed hand drum called pahu tupa ? i rima , and a double @-@ headed bass drum called tariparau .

=== Asia ===

In Shaanxi in the north of China , drum ensembles accompany yangge dance , and in the Tianjin area there are ritual percussion ensembles such as the Fagu hui Dharma @-@ drumming associations , often consisting of dozens of musicians . In Korea , a style of folk music called Nongak (farmers ' music) or pungmul has been performed for many hundred years , both by local players and by professional touring bands at concerts and festivals . It is loud music meant for

outdoor performance , played on percussion instruments such as the drums called janggu and puk , and the gongs ching and kkwaenggwari . It originated in simple work rhythms to assist repetitive tasks carried out by field workers .

South Asian music places a special emphasis on drumming , which is freed from the primary time @-@ keeping function of drumming found in other part of the world . In North India , secular processional bands play an important role in civic festival parades and the b?r?t processions leading a groom 's wedding party to the bride 's home or the hall where a wedding is held . These bands vary in makeup , depending on the means of the families employing them and according to changing fashions over time , but the core instrumentation is a small group of percussionists , usually playing a frame drum (?aphal?) , a gong , and a pair of kettledrums (nag???) . Better @-@ off families will add shawms (shehnai) to the percussion , while the most affluent who also prefer a more modern or fashionable image may replace the traditional ensemble with a brass band . The Karnatic music of southern India includes a tradition of instrumental temple music in the state of Kerala , called k??tram v?dyam . It includes three main genres , all focussed on rhythm and featuring unpitched percussion . Thayambaka in particular is a virtuoso genre for unpitched percussion only : a solo double @-@ headed cylindrical drum called chenda , played with a pair of sticks , and accompanied by other chenda and elathalam (pairs of cymbals) . The other two genres , panchavadyam and pandi melam add wind instruments to the ensemble , but only as accompaniment to the primary drums and cymbals . A panchavadyam piece typically lasts about an hour , while a pandi melam performance may be as long as four hours .

= = = = Turkey = = = =

The Turkish janissaries military corps had included since the 14th century bands called mehter or mehterân which , like many other earlier military bands in Asia featured a high proportion of drums , cymbals , and gongs , along with trumpets and shawms . The high level of noise was pertinent to their function of playing on the battlefield to inspire the soldiers . The focus in these bands was on percussion . A full mehterân could include several bass drums , multiple pairs of cymbals , small kettledrums , triangles , tambourines , and one or more Turkish crescents .

= = = = Europe = = = =

Through Turkish ambassadorial visits and other contacts , Europeans gained a fascination with the " barbarous " , noisy sound of these bands , and a number of European courts established " Turkish " military ensembles in the late @-@ 17th and early 18th centuries . The music played by these ensembles , however , were not authentically Turkish music , but rather compositions in the prevalent European manner . The general enthusiasm quickly spread to opera and concert orchestras , where the combination of bass drum , cymbals , tambourines , and triangles were collectively referred to as " Turkish music " . The best @-@ known examples include Haydn 's Symphony No. 100 , which acquired its nickname , " The Military " , from its use of these instruments , and three of Beethoven 's works : the " alla marcia " section from the finale of his Symphony No. 9 (an early sketch reads : " end of the Symphony with Turkish music ") , his " Wellington 's Victory " ? or Battle Symphony ? with picturesque sound effects (the bass drums are designated as " cannons " , side drums represent opposing troops of soldiers , and ratchets the sound of rifle fire) , and the " Turkish March " (with the expected bass drum , cymbals , and triangle) and the " Chorus of Dervishes " from his incidental music to The Ruins of Athens , where he calls for the use of every available noisy instrument : castanets , cymbals , and so forth . By the end of the 18th century , the batterie turque had become so fashionable that keyboard instruments were fitted with devices to simulate the bass drum (a mallet with a padded head hitting the back of the sounding board) , cymbals (strips of brass striking the lower strings) , and the triangle and bells (small metal objects struck by rods) . Even when percussion instruments were not actually employed , certain alla turca " tricks " were used to imitate these percussive effects . Examples include the " Rondo alla turca " from Mozart 's Piano Sonata , K. 331 , and part of the finale of his Violin Concerto , K. 219 .

===== Harpsichord , piano , and organ =====

At about the same time that " Turkish music " was coming into vogue in Europe , a fashion for programmatic keyboard music opened the way for the introduction of another kind of noise in the form of the keyboard cluster , played with the fist , flat of the hand , forearm , or even an auxiliary object placed on the keyboard . On the harpsichord and piano , this device was found mainly in " battle " pieces , where it was used to represent cannon fire . The earliest instance was by Jean @-@ François Dandrieu , in *Les Caractères de la guerre* (1724) , and for the next hundred years it remained predominantly a French feature , with examples by Michel Corrette (*La Victoire d 'un combat naval , remportée par une frégate contre plusieurs corsaires réunis* , 1780) , Claude @-@ Bénigne Balbastre (*March des Marseillois* , 1793) , Pierre Antoine César (*La Bataille de Gemmap , ou la prise de Mons* , ca . 1794) , and Jacques @-@ Marie Beauvarlet @-@ Charpentier (*Bataille d 'Austerlitz* , 1805) . In 1800 , Bernard Viguier introduced the sound to chamber music , in the keyboard part of a piano trio titled *La Bataille de Maringo , pièce militaire et historique* . The last time this pianistic " cannon " effect was used before the 20th century was in 1861 , in a depiction of the then @-@ recent The Battle of Manassas in a piece by the black American piano virtuoso " Blind Tom " Bethune , a piece that also feature vocalised sound @-@ effect noises .

Clusters were also used on the organ , where they proved more versatile (or their composers more imaginative) . Their most frequent use on this instrument was to evoke the sound of thunder , but also to portray sounds of battle , storms at sea , earthquakes , and Biblical scenes such as the fall of the walls of Jericho and visions of the apocalypse . The noisy sound nevertheless remained a special sound effect , and was not integrated into the general texture of the music . The earliest examples of " organ thunder " are from descriptions of improvisations by Abbé Vogler in the last quarter of the 18th century . His example was soon imitated by Justin Heinrich Knecht (*Die durch ein Donerwetter [sic] unterbrochne Hirtenwonne* , 1794) , Michel Corrette (who employed a length of wood on the pedal board and his elbow on the lowest notes of the keyboard during some improvisations) , and also in composed works by Guillaume Lasceux (*Te Deum : " Judex crederis "* , 1786) , Sigismond Neukomm (*A Concert on a Lake , Interrupted by a Thunderstorm*) , Louis James Alfred Lefébure @-@ Wély (*Scène pastorale* , 1867) , Jacques Vogt (*Fantaisie pastorale et orage dans les Alpes* , ca . 1830) , and Jules Blanc (*La procession* , 1859) . The most notable 19th @-@ composer to use such organ clusters was Giuseppe Verdi . The storm music which opens his opera *Otello* (1887) includes an organ cluster (C , C ? , D) that is also the longest notated duration of any scored musical texture .

===== Bowed strings =====

Percussive effects in imitation of drumming had been introduced to bowed @-@ string instruments by early in the 17th century . The earliest known use of *col legno* (tapping on the strings with the back of the bow) is found in Tobias Hume 's *First Part of Ayres* for unaccompanied viola da gamba (1605) , in a piece titled *Harke , Harke* . Carlo Farina , an Italian violinist active in Germany , also used *col legno* to mimic the sound of a drum in his *Capriccio stravagante* for four stringed instruments (1627) , where he also used devices such as glissando , tremolo , pizzicato , and *sul ponticello* to imitate the noises of barnyard animals (cat , dog , chicken) . Later in the century , Heinrich Ignaz Franz Biber , in certain movements of *Battalia* (1673) , added to these effects the device of placing a sheet of paper under the A string of the double bass , in order to imitate the dry rattle of a snare drum , and in " *Die liederliche Gesellschaft von allerley Humor* " from the same programmatic battle piece , superimposed eight different melodies in different keys , producing in places dense orchestral clusters . He also uses the percussive snap of fortissimo pizzicato to represent gunshots .

An important aspect of all of these examples of noise in European keyboard and string music before the 19th century is that they are used as sound effects in programme music . Sounds that would likely cause offense in other musical contexts are made acceptable by their illustrative

function . Over time , their evocative effect was weakened as at the same time they became incorporated more generally into abstract musical contexts .

===== Orchestras =====

Orchestras continued to use noise in the form of a percussion section , which expanded though the 19th century : Berlioz was perhaps the first composer to thoroughly investigate the effects of different mallets on the tone color of timpani . However , before the 20th century , percussion instruments played a very small role in orchestral music and mostly served for punctuation , to highlight passages , or for novelty . But by the 1940s , some composers were influenced by non @-@ Western music as well as jazz and popular music , and began incorporating marimbas , vibraphones , xylophones , bells , gongs , cymbals , and drums .

===== Vocal music =====

In vocal music , noisy nonsense syllables were used to imitate battle drums and cannon fire long before Clément Janequin made these devices famous in his programmatic chanson *La bataille* (*The Battle*) in 1528 . Unpitched or semi @-@ pitched performance was introduced to formal composition in 1897 by Engelbert Humperdinck , in the first version of his melodrama , *Königskinder* . This style of performance is believed to have been used previously by singers of lieder and popular songs . The technique is best known , however , from somewhat later compositions by Arnold Schoenberg , who introduced it for solo voices in his *Gurrelieder* (1900 ? 11) , *Pierrot Lunaire* (1913) , and the opera *Moses und Aron* (1930 ? 32) , and for chorus in *Die glückliche Hand* (1910 ? 13) . Later composers who have made prominent use of the device include Pierre Boulez , Luciano Berio , Benjamin Britten (in *Death in Venice* , 1973) , Mauricio Kagel , and Wolfgang Rihm (in his opera *Jakob Lenz* , 1977 ? 78 , amongst other works) . A well @-@ known example of this style of performance in popular music was Rex Harrison 's portrayal of Professor Henry Higgins in *My Fair Lady* . Another form of unpitched vocal music is the speaking chorus , prominently represented by Ernst Toch 's 1930 *Geographical Fugue* , an example of the *Gebrauchsmusik* fashionable in Germany at that time .

===== Machine music =====

In the 1920s a fashion emerged for composing what was called " machine music " ? the depiction in music of the sounds of factories , locomotives , steamships , dynamos , and other aspects of recent technology that both reflected modern , urban life and appealed to the then @-@ prevalent spirit of objectivity , detachment , and directness . Representative works in this style , which features motoric and insistent rhythms , a high level of dissonance , and often large percussion batteries , are George Antheil 's *Ballet mécanique* (1923 ? 25) , Arthur Honegger 's *Pacific 231* (1923) , Sergei Prokofiev 's ballet *Le pas d 'acier* (*The Steel Leap* , 1925 ? 26) , Alexander Mosolov 's *Iron Foundry* (an orchestral episode from his ballet *Steel* , 1926 ? 27) , and Carlos Chávez 's ballet *Caballos de vapor* , also titled *HP* (*Horsepower* , 1926 ? 32) . This trend reached its apex in the music of Edgard Varèse , who composed *Ionisation* in 1931 , a " study in pure sonority and rhythm " for an ensemble of thirty @-@ five unpitched percussion instruments .

===== Percussion ensembles =====

Following Varèse 's example , a number of other important works for percussion ensemble were composed in the 1930s and 40s : Henry Cowell 's *Ostinato Pianissimo* (1934) combines Latin American , European , and Asian percussion instruments ; John Cage 's *First Construction* (in *Metal*) (1939) employs differently pitched thunder sheets , brake drums , gongs , and a water gong ; Carlos Chávez 's *Toccata for Percussion* (1943) requires six performers to play a large number of European and Latin @-@ American drums and other unpitched percussion together with a few

tuned instruments such as xylophone , tubular chimes , and glockenspiel ; Lou Harrison , in works such as the Canticles nos . 1 and 3 (1940 and 1942) , Song of Queztalcoatl (1941) , Suite for Percussion (1942) , and ? in collaboration with John Cage ? Double Music (1941) explored the use of " found " instruments , such as brake drums , flowerpots , and metal pipes . In all of these works , elements such as timbre , texture , and rhythm take precedence over the usual Western concepts of harmony and melody .

= = = Experimental and avant @-@ garde music = = =

Use of noise was central to the development of experimental music and avant @-@ garde music in the mid 20th century . Noise was used in important , new ways .

Edgard Varèse challenged traditional conceptions of musical and non @-@ musical sound and instead incorporated noise based sonorities into his compositional work , what he referred to as " organised sound . " Varèse stated that " to stubbornly conditioned ears , anything new in music has always been called noise " , and he posed the question , " what is music but organized noises ? " .

In the years immediately following the First World War , Henry Cowell composed a number of piano pieces featuring tone clusters and direct manipulation of the piano 's strings . One of these , titled The Banshee (1925) , features sliding and shrieking sounds suggesting the terrifying cry of the banshee from Irish folklore .

In 1938 for a dance composition titled Bacchanale , John Cage invented the prepared piano , producing both transformed pitches and colorful unpitched sounds from the piano . Many variations , such as prepared guitar , have followed . In 1952 , Cage wrote 4 ? 33 ? , in which there is no deliberate sound at all , but only whatever background noise occurs during the performance .

Karlheinz Stockhausen employed noise in vocal compositions , such as Momente (1962 ? 64 / 69) , in which the four choirs clap their hands , talk , and shuffle their feet , in order to mediate between instrumental and vocal sounds as well as to incorporate sounds normally made by audiences into those produced by the performers .

Robert Ashley used audio feedback in his avant @-@ garde piece The Wolfman (1964) by setting up a howl between the microphone and loudspeaker and then singing into the microphone in way that modulated the feedback with his voice .

= = = Electronic music = = =

Noise is used as basic tonal material in electronic music .

When pure @-@ frequency sine tones were first synthesised into complex timbres , starting in 1953 , combinations using inharmonic relationships (noises) were used far more often than harmonic ones (tones) . Tones were seen as analogous to vowels , and noises to consonants in human speech , and because traditional music had emphasised tones almost exclusively , composers of electronic music saw scope for exploration along the continuum stretching from single , pure (sine) tones to white noise (the densest superimposition of all audible frequencies) ? that is , from entirely periodic to entirely aperiodic sound phenomena . In a process opposite to the building up of sine tones into complexes , white noise could be filtered to produce sounds with different bandwidths , called " coloured noises " , such as the speech sounds represented in English by sh , f , s , or ch . An early example of an electronic composition composed entirely by filtering white noise in this way is Henri Pousseur 's Scambi (Exchanges) , realised at the Studio di Fonologia in Milan in 1957 .

In the 1980s , electronic white noise machines became commercially available . These are used alone to provide a pleasant background noise and to mask unpleasant noise , a similar role to conventional background music . This usage can have health applications in the case of individuals struggling with over @-@ stimulation or sensory processing disorder . Also , white noise is sometimes used to mask sudden noise in facilities with research animals .

= = = Rock music = = =

While the electric guitar was originally designed to be simply amplified in order to reproduce its sound at a higher volume , guitarists quickly discovered the creative possibilities of using the amplifier to modify the sound , particularly by extreme settings of tone and volume controls .

Distortion was at first produced by simply overloading the amplifier to induce clipping , resulting in a tone rich in harmonics and also in noise , and also producing dynamic range compression and therefore sustain (and sometimes destroying the amplifier) . Dave Davies of The Kinks took this technique to its logical conclusion by feeding the output from a 60 watt guitar amplifier directly into the guitar input of a second amplifier . The popularity of these techniques quickly resulted in the development of electronic devices such as the fuzz box to produce similar but more controlled effects and in greater variety . Distortion devices also developed into vocal enhancers , effects units that electronically enhance a vocal performance , including adding air (noise or distortion , or both) . Guitar distortion is often accomplished through use of feedback , overdrive , fuzz , and distortion pedals . Distortion pedals produce a crunchier and grittier tone than an overdrive pedal .

As well as distortion , rock musicians have used audio feedback , which is normally undesirable . The use of feedback was pioneered by musicians such as John Lennon of The Beatles , Jeff Beck of The Yardbirds , Pete Townshend of The Who , and Jimi Hendrix . Hendrix was able to control feedback and turn it into a musical quality , and his use of noise has been described as " sculpted - liquid and fire expertly shaped in mid @-@ air as if by a glass blower . " Other techniques used by Hendrix include distortion , wah , fuzz , dissonance , and loud volume .

= = = Jazz = = =

In the mid @-@ 1960s , jazz began incorporating elements of rock music , and began using distortion and feedback , partially due to the efforts of Jimi Hendrix , who had strong links with jazz . The proto @-@ punk band MC5 also used feedback and loudness and was inspired by the avant @-@ garde jazz movement . Jazz musicians who have incorporated noise elements , feedback and distortion include Bill Frisell , David Krakauer Cecil Taylor , Gábor Szabó , Garnett Brown , Grachan Moncur III , Jackie McLean , John Abercrombie , John McLaughlin , Joseph Bowie , Larry Coryell , McCo Tyner , Ornette Coleman , Pat Metheny , Phil Minton , Roswell Rudd , and Scott Henderson .

= = = Hip hop = = =

Since its origins in the Bronx during the 1970s , hip hop music has been associated with noise . Author Mark Katz explains that " for the pioneering hip @-@ hop DJs , merely to exist in the Bronx was to experience near @-@ constant noise . But DJs did more than experience noise , they created it , and through their massive sound systems , they indelibly shaped the Bronx soundscape . " According to Katz , the use of loud , extravagant sound systems communicated power and territorial control . Furthermore , techniques such as scratching are an expression of transgression . As scratching a record damages it , scratching , like the visual art of graffiti , is a form of vandalism . " It is a celebration of noise , " writes Katz , " and no doubt part of the pleasure it brought to DJs came from the knowledge that it annoyed the older generation . " Scholar William Jelani Cobb states that " though the genre will always be dismissed by many as brash , monotonous noise , the truth is that hip hop has undergone an astounding array of lyrical and musical transformations . " Scholar Ronald Radano writes that " no term in the modern lexicon conveys more vividly African @-@ American music 's powers of authenticity and resistance than the figure of ' noise ' . In hip @-@ hop parlance , ' noise , ' specifically ' black noise ' , is that special insight from the inside , the anti @-@ philosophy that emerges front and center through the sound attack of rap . " Radano finds the appearance of " black noise " nearly everywhere in the " transnational repetitions of rap opposition , " but stresses that despite its global nature , black noise still conforms to American racial structures . Radano states that " rather than radicalizing the stable binaries of race , noise inverts them ; it transforms prior signs of European musical mastery ? harmony , melody , song ? into all that is bitchin ' , kickin ' , and black . "

The hip hop group Public Enemy in particular has been noted for its use of noise in its music . The

group 's second album , It Takes a Nation of Millions to Hold Us Back , was backed by the production team The Bomb Squad , who helped craft the album 's layered , anti @-@ harmonic , anarchic noise . Michael Eric Dyson describes the album as a " powerful mix of music , beats , screams , noise , and rhythms from the streets " , and considers it an example of the revival of black radical and nationalist thought . Public Enemy member Chuck D acknowledges that the group 's use of noise was an intentional attempt to blur the boundaries between popular music and the noise of everyday life , a decision which writer Jason W. Buel says " ran directly counter to the values of mainstream music of the time . " He explains that " without a doubt " this intentional use of noise influenced not only the next decade of hip @-@ hop , but of rock as well . Furthermore , notes Buel , the incorporation of noise served a political function , elevating the ordinary and thus suggesting that common , ordinary people should consider themselves on the same footing as their political and cultural leaders .

= = Noise as a type of music = =

Noise music (also referred to simply as noise) has been represented by many genres during the 20th century and subsequently . Some of its proponents reject the attempt to classify it as a single overall genre , preferring to call noise music a non @-@ genre , an aesthetic , or a collection of genres . Even among those who regard it as a genre , its scope is unclear . Some commentators use the phrase " noise music " (or " noise ") to refer specifically to Japanese noise music , while others instead use the term Japanoise .

While noise music is often nowadays associated with extreme volume and distortion and produced by electronic amplification , the tradition dates back at least to the Futurist Luigi Russolo , who rejected melody , constructed original instruments known as intonarumori and assembled a " noise orchestra " in 1917 . It was not well received . In his 1913 manifesto The Art of Noises he observes :

At first the art of music sought purity , limpidity and sweetness of sound . Then different sounds were amalgamated , care being taken , however , to caress the ear with gentle harmonies . Today music , as it becomes continually more complicated , strives to amalgamate the most dissonant , strange and harsh sounds . In this way we come ever closer to noise @-@ sound .

= = = Some types of noise music = = =

Noise music , abandoning melody , harmony , and sometimes even pulse and rhythm
Industrial music (1970s)
Noise rock and noise pop (1980s)
Japanoise (late 1970s - current)
Glitch (1990s)

= = Noise reduction = =

Most often , musicians are concerned not to produce noise , but to minimise it . Noise reduction is of particular concern in sound recording . This is accomplished by many techniques , including use of low noise components and proprietary noise reducing technologies such as Dolby .

In both recording and in live musical sound reinforcement , the key to noise minimisation is headroom . Headroom can be used either to reduce distortion and audio feedback by keeping signal levels low , or to reduce interference , both from outside sources and from the Johnson @-@ Nyquist noise produced in the equipment , by keeping signal levels high . Most proprietary noise reducing technologies also introduce low levels of distortion . Noise minimisation therefore becomes a compromise between interference and distortion , both in recording and in live music , and between interference and feedback in live amplification . The work of Bart Kosko and Sanya Mitaim has also demonstrated that stochastic resonance can be used as a technique in noise minimisation and signal improvement in non @-@ linear dynamical systems , as the addition of noise to a signal

can improve the signal @-@ to @-@ noise ratio .

Noise created by mobile phones has become a particular concern in live performances , particularly those being recorded . In one notable incident , maestro Alan Gilbert halted the New York Philharmonic in a performance of Gustav Mahler 's Symphony No. 9 until an audience member 's iPhone was silenced .

= = Noise as excessive volume = =

Music played at excessive volumes is often considered a form of noise pollution . Governments such as that of the United Kingdom have local procedures for dealing with noise pollution , including loud music .

Noise as high volume is common for musicians from classical orchestras to rock groups as they are exposed to high decibel ranges . Although some rock musicians experience noise @-@ induced hearing loss from their music , it is still debated as to whether classical musicians are exposed to enough high @-@ intensity sound to cause hearing impairments . Nevertheless , in 2008 Trygve Nordwall , the manager of the Bavarian Radio Symphony Orchestra , invoked new EU rules forbidding more than 85 decibels in the workplace , as a reason for dropping the planned world premiere of Dror Feiler 's composition Halat Hisar (State of Siege) because it was " adverse to the health " of the musicians . The twenty @-@ minute piece begins with a burst of machine @-@ gun fire , and gets louder . Readings taken during rehearsals measured at least 130 decibels , and some members of the orchestra reported suffering headaches and permanent tinnitus after sustained exposure for three hours during rehearsals . Earplugs for the musicians were suggested , but they objected they could not hear each other and the composer also rejected the idea , adding that his composition was " no louder than anything by Shostakovich or Wagner " .

Music @-@ induced hearing loss is still a controversial topic for hearing researchers . While some studies have shown that the risk for hearing loss increases as music exposure increases , other studies found little to no correlation between the two .

Many bands , primarily in the rock genre , use excessive volumes intentionally . Several bands have set records as the loudest band in the world , with Deep Purple , The Who , and Manowar having received entries in the Guinness Book of World Records . Other claimants to the title include Motörhead , Led Zeppelin , Blue Cheer , Gallows , Bob Dylan 's 1965 backing electric band , Grand Funk Railroad , Canned Heat , and the largely fictional parody group Spinal Tap . My Bloody Valentine are known for their " legendarily high " volume concerts , and Sunn O))) are described as surpassing them . The sound levels at Sunn O))) concerts are intentionally loud enough that they are noted for having physical effects on their audience .

= = Noise in general = =

Noise (disambiguation) for a list of other articles related to noise

Noise (electronics)

= = Relating noise to music = =

The definition of music , detailed discussions

Phonaesthetics for the aesthetics of sound , and particularly what is meant by cacophony

Aesthetics of music

Inharmonicity , one of the factors causing a sound to be perceived as unpitched

Consonance and dissonance # Dissonance for discussion of the nature and usage of discords in melody and harmony and similar devices in rhythm and metre

Timbral listening

= = Related types = =

Free jazz
Percussion ensemble

== Related types of music ==

Category : Noise music for an automated list of articles related to noise as a type of music

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