way of the nerves which serve to enlarge or contract the orifices of the heart. From this it can be clearly understood why in my definition I have declared each of them to be caused by some one particular movement of the spirits.

[46.] There is one special reason why the soul is unable to change or suppress its passions in an effortless manner, and this reason is what has led me, in defining them, to say that they are not merely caused, but also upheld and fortified by some particular movement of the animal spirits. They are almost all accompanied by some commotion taking place in the heart, and consequently also in all the blood and animal spirits, so that until this commotion has subsided, the passions remain present to our thought in the same manner as sensible objects are present to us in thought during the time they act on our sense-organs. Just as the soul, in making itself closely attentive to some other thing, can prevent itself from hearing a slight noise or feeling a slight pain, but cannot in the same way escape hearing thunder or feeling fire burning the hand, it is similarly easy to overcome the lesser passions, but not those that are more violent and powerful; we have to await the abating of the commotion in the blood and spirits. The most the will can do while this commotion is in its full strength, is to refuse consent to its effects, and to restrain several of the movements to which it disposes the body. For instance if anger causes the hand to be upraised for striking, the will can usually arrest it from further action; if fear incites the legs to flight, the will can restrain them, and so in all other like cases.

[69.] There are only six simple and primitive passions, i.e., wonder, love, hatred, desire, joy, and sadness. All the others are composed of some of these six, or are species of them. That is why, in order that their multitude may not embarrass my readers, I shall here treat the six primitive passions separately; and afterwards I shall show in what way all the others derive from them their origin.

[70.] *Of Wonder, its definition and cause.* Wonder is a sudden surprise of the soul which causes it to apply itself to consider with attention the objects which seem to it rare and extraordinary. It is thus primarily caused by the impression we have in the brain which represents the object as rare, and as consequently worthy of much consideration; then afterwards by the movement of the spirits, which are disposed by this impression to tend with great force towards the part of the brain where it is, in order to fortify and conserve it there; as they are also disposed by it to pass thence into the muscles which serve to retain the organs of the senses in the same situation in which they are, so that it is still maintained by them, if it is by them that it has been formed.

[71.] And this passion has this particular characteristic, that in it we do not notice that it is accompanied by any change which occurs in the heart and blood like the other passions. The reason of this is that not having good or evil as its object, but only the knowledge of the thing that we wonder at, it has no relation with the heart and blood on which all the good of the body depends, but only with the brain where are the organs of the senses which are the instruments of this knowledge.

[79.] *The definition of Love and Hate.* Love is an emotion of the soul caused by the movement of the spirits which incites it to join itself willingly to objects which appear to it to be agreeable. And hatred is an emotion caused by the spirits which incite the soul to desire to be separated from the objects which present themselves to it as hurtful. I say that these emotions are caused by the spirits in order to distinguish love and hate, which are passions and depend on the body, both from the judgments which also induce the soul by its free will to unite itself with the things which it esteems to be good, and to

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separate itself from those it holds to be evil, and from the emotions which these judgments excite of themselves in the soul.

[91.] *The definition of Joy.* Joy is an agreeable emotion of the soul in which consists the enjoyment that the soul possesses in the good which the impressions of the brain represent to it as its own. I say that it is in this emotion that the enjoyment of the good consists; for as a matter of fact the soul receives no other fruits from all the good things that it possesses; and while it has no joy in these, it may be said that it does not enjoy them more than if it did not possess them at all. I add also that it is of the good which the impressions of the brain represent to it as its own, in order not to confound this joy, which is a passion, with the joy that is purely intellectual, and which comes into the soul by the action of the soul alone, and which we can call an agreeable emotion excited in it, in which the enjoyment consists which it has in the good which its understanding represents to it as its own. It is true that while the soul is united to the body this intellectual joy can hardly fail to be accompanied by that which is a passion; for as soon as our understanding perceives that we possess some good thing, even though this good may be so different from all that pertains to body that it is not in the least capable of being imagined, imagination does not fail immediately to make some impression in the brain from which proceeds the movement of the spirits that excites the passion of joy.

[104.] *The movement of the blood and spirits in Joy.* In joy it is not so much the nerves of the spleen, the liver or the stomach, or the intestines, which are active, as those which are in the whole of the rest of the body, and particularly that which is round the orifices of the heart, which, opening and enlarging these orifices, supplies the means whereby the blood which the other nerves drive from the veins to the heart may enter there and issue forth in a larger quantity than usual. And because the blood which then enters the heart has already passed and repassed there several times, having come from the arteries to the veins, it dilates very easily and produces spirits whose parts, being very equal and subtle, are proper for the formation and fortification of the impressions of the brain which give to the soul thoughts that are gay and peaceful.

[92.] *The definition of Sadness.* Sadness is a disagreeable languor in which consists the discomfort and unrest which the soul receives from evil, or from the defect which the impressions of the brain set before it as pertaining to it. And there also is an intellectual sadness which is not passion, but which hardly ever fails to be accompanied by it.

[105.] *The movement of the blood and spirits in Sadness.* In sadness, the openings of the heart are much contracted by the small nerve which surrounds them, and the blood of the veins is in nowise agitated, which brings it to pass that very little of it goes towards the heart and yet the passages by which the juice of the food flows from the stomach and the intestines towards the liver remain open, which causes the appetite not to diminish at all, excepting when hatred, which is often united to sadness, closes them.

[86.] *The definition of Desire.* The passion of desire is an agitation of the soul caused by the spirits which dispose it to wish for the future the things which it represents to itself as agreeable. Thus we do not only desire the presence of the absent good, but also the conservation of the present, and further, the absence of evil, both of that which we already have, and of that which we believe we might experience in time to come.

[87.] I know very well that usually in the schools the passion which makes for the search after the good which alone is called desire is opposed to that which makes for the avoidance of evil, which is called aversion. But inasmuch as there is no good whose

privation is not an evil, nor any evil considered in a positive sense, whose privation is not a good, and that in investigating riches, for example, we necessarily shun poverty, in fleeing from sickness we make for health, and so on with other things, it seems to me that it is always an identical movement which makes for the search after good, and at the same time for the avoidance of the evil that is contrary to it.

[148.] *The exercise of virtue is a sovereign remedy against the passions.* It is certain that, provided our soul is always possessed of something to content itself with inwardly, none of the troubles that come from elsewhere have any power to harm it, but rather serve to increase its joy, inasmuch as, seeing that it cannot be harmed by them, it is made sensible of its perfection. And in order that our souls may thus have something with which to be content, it has no need but to follow exactly after virtue. For whoever has lived in such a way that his conscience cannot reproach him for ever having failed to perform those things which he has judged to be the best (which is what I here call following after virtue) receives from this a satisfaction which is so powerful in rendering him happy that the most violent efforts of the passions never have sufficient power to disturb the tranquillity of his soul.

[212]. For the rest, the soul may have pleasures of its own, but as to those which are common to it and the body, they depend entirely on the passions, so that the men whom they can most move are capable of partaking most of the enjoyment in this life. It is true that such men may also find most bitterness when they do not know how to employ them well, or fortune is contrary to them. But the principal use of prudence or self-control is that it teaches us to be masters of our passions, and to so control and guide them that the evils which they cause are quite bearable, and that we even derive joy from them all.

Through [46]: Norman Kemp Smith (ed. and trans.), *Descartes' Philosophical Writings* (London: Macmillan, 1952), 285, 292, 295–97, 300–301; by permission of Macmillan, London and Basingstoke. From [69] to the end: Elizabeth S. Haldane and G. R. T. Ross (trans.), *The Philosophical Works of Descartes,* I (Cambridge: Cambridge University Press, 1911), 362, 366, 369–70, 372, 377, 398–99, 427; by permission of Cambridge University Press.

Among the musicians (once again, mainly German) who turned Cartesian psychology into systematic musical theory, Johann Mattheson (1681–1764) was outstanding. A composer and performer of considerable reputation, Mattheson was also an encyclopedic theorist in the tradition of Praetorius and Mersenne. In his *Der volkommene Capellmeister* (*The Complete Music Master*), published in 1739, Mattheson openly acknowledged his debt to Descartes and proceeded to apply the Frenchman's teachings to the establishment of precepts for musical composition. This new theory of emotion in music (the *Affektenlehre,* or "The Doctrine of the Affections," as it was often called) was a significant departure from the earlier doctrine of figures. Now the object of imitation was no longer speech, the exterior manifestation of emotion, but the emotion itself, in terms at once more direct and more generalized. Emotions were represented not as transient feelings embodied in a free and flexible recitative, but as monolithic, static, "objective" phenomena to be musically concretized by a whole piece of coherent, often monumental structure. The most direct realization of this theory is found in the *opera seria* of the late Baroque, with its stylized and rigidly classified aria types associated with the various "affections." Many of these were based on recognizable dance rhythms, thus supporting Mattheson's classification of dance types as analogies to the emotional typology he had taken over from Descartes.

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Mattheson now proceeds
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The most important and outstanding part of the science of sound is the part that examines the effects of well-disposed sounds on the emotions and the soul. This, as may be readily seen, is material that is as far-reaching as it is useful. To the musical practitioner it is of even more importance than to the theoretician, despite its primary concern with observation. Of much assistance here is the doctrine of the temperaments and emotions, concerning which Descartes is particularly worthy of study, since he has done much in music. This doctrine teaches us to make a distinction between the minds of the listeners and the sounding forces that have an effect on them.

What the passions are, how many there are, how they may be moved, whether they should be eliminated or admitted and cultivated, appear to be questions belonging to the field of the philosopher rather than the musician. The latter must know, however, that the sentiments are the true material of virtue, and that virtue is nought but a well-ordered and wisely moderate sentiment. Those affects, on the other hand, which are our strongest ones, are not the best and should be clipped or held by the reins. This is an aspect of morality which the musician must master in order to represent virtue and evil with his music and to arouse in the listener love for the former and hatred for the latter. For it is the true purpose of music to be, above all else, a moral lesson.

Those who are learned in the natural sciences know how our emotions function physically, as it were. It would be advantageous to the composer to have a little knowledge of this subject. Since, for example, joy is an *expansion* of our vital spirits, it follows sensibly and naturally that this affect is best expressed by large and expanded intervals. Sadness, on the other hand, is a *contraction* of those same subtle parts of our bodies. It is, therefore, easy to see that the narrowest intervals are the most suitable. Love is a *diffusion* of the spirits. Thus, to express this passion in composing, it is best to use intervals of that nature. Hope is an *elevation* of the spirit; despair, on the other hand, a *casting down* of the same. These are subjects that can well be represented by sound, especially when other circumstances (tempo in particular) contribute their share. In such a manner one can form a concrete picture of all the emotions and try to compose accordingly.

Pride, haughtiness, arrogance, etc., all have their respective proper musical color as well. Here the composer relies primarily on boldness and pompousness. He thus has the opportunity to write all sorts of fine-sounding musical figures that demand special seriousness and bombastic movement. They must never be too quick or falling, but always ascending. The opposite of this sentiment lies in humility, patience, etc., treated in music by abject-sounding passages without anything that might be elevating. The latter passions, however, agree with the former in that none of them allow for humor and playfulness.

Music, although its main purpose is to please and to be graceful, must sometimes provide dissonances and harsh-sounding passages. To some extent and with the suitable means, it must provide not only unpleasant and disagreeable things, but even frightening and horrible ones. The spirit occasionally derives some peculiar pleasure even from these.

Mattheson now proceeds to the discussion of dance types as analogies to the affections.

The *minuet,* whether it be made especially for playing, singing, or dancing, has no other affect than *moderate gaiety.*

Next let us look at the *gavotte,* whose affect is truly *jubilant joy.* The *hopping* quality of the *gavotte* is its true property. A melody having a more fluid, smooth, gliding, and connected character than the *gavotte* is the *bourrée.* Such melodies seem contented, obliging, unconcerned, relaxed, careless, comfortable, and yet pleasing. We continue by taking up the *rigaudon,* whose melody is, in my opinion, one of the most pleasing. Its character is one of *flirtatious pleasantry.* Our next examination concerns the *march,* which can be either serious or droll. Its true character is *heroic* and *fearless,* yet it is not wild or running. The composer must form his picture by thinking of a hero, with a firm spirit that is unseated or shaken by nothing. Such a spirit is swayed neither by clever arguments nor by heated passions. The picture the composer should bear in mind is not that of a raging fire but of courageous warmth.

We shall let something fresh and quick follow these serious melodies, namely, the *gigue,* whose special quality is *hot and hurried eagerness,* anger that soon evaporates. The *loures,* or slow and dotted gigues, by contrast, exhibit a *proud* and *pompous* character, which makes them very popular in Spain. The *canarie* must have a very *desirous quality* and quickness, but it should be somewhat simple-minded.

All these remarks are not aimed so much at an understanding of particular dances as at the complete comprehension of the wealth contained in them and the clever use of this wealth. They are useful in many compositions that are seemingly of a more important nature, especially in tasteful vocal music and in the expression of all kinds of passions. The incredible ideas that may flow from these unassuming sources are countless. Bear this remark in mind! There are arias in gigue tempo, just as there are arias based on the other species of melody. This applies to the very effective *loure* type of *gigue* especially. With nothing more than the gigue I can express four important affects: anger or eagerness, pride, simple-minded desire, and flightiness. On the other hand, if I had to set *open-hearted* and *frank* words to music, I should choose no species of melody other than the Polish one, the *polonaise.* In my opinion, this is its quality, character, and affect. A people's character seldom remains hidden in its entertainment and dances, even though it might on other occasions.

Hans Lenneberg, "Johann Mattheson on Affect and Rhetoric," *Journal of Music Theory,* II (1958), 47–84, 193–236, *passim.* Reprinted by permission.

60

The Art of Music Reduced to Rational Principles

A major breakthrough in the investigation of sound was Joseph Sauveur's discovery of the "chord of nature," the phenomenon of vibration we now call the overtone series. His findings were published in 1701, and made the basis of a general theory of music by Jean-Philippe Rameau (1683–1764), whose *Traité de l'harmonie* (1722) was the first musical treatise to embody the new rational empiricism of the Baroque. For the first time the bass was recognized as a harmonic generator in theory, although it had been functioning that way in practice for over a century. Rameau made harmony the

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This deed won me the highest honor I could have received; for the report of it, having spread throughout Rome, came as far as the ears of His Holiness, who did me the special favor a few days later of sending for me, and said to me, among other things, "We have heard that you have a special talent and we would like to hear you." I will not tell you here how happy His Holiness showed himself to be after having done me the honor of listening to me for more than two hours; some day you will see people worthy of being believed, and they will give you a full account of it.

André Maugars, *Response faite à un curieux sur le sentiment de la musique d'Italie, escrite à Rome le premier Octobre 1639*, trans. Walter H. Bishop, *Journal of the Viola da Gamba Society of America*, VIII (1971), 5–17. Reprinted by permission of Efrim Fruchtman, editor.

54

Music under the Sun King

During the seventeenth century, which the French still call their "grand siècle," music attended the French kings everywhere. They rose in the morning to the sound of the oboes and brasses of the Great Stable (Grande Écurie), they danced to the music of their famous "twenty-four violins" (also known as the Grande Bande), and were regaled at meals by a smaller band of fiddlers, known as the Petits Violons. In the Royal Chapel they heard the crowning musical expressions of their majesty and power: the *grands motets*, often sung by a choir of sixty, accompanied by an orchestra to match. At its height under Louis XIV, the royal musical establishment at Versailles numbered some 120 musicians. The description given by Pierre Rameau, dancing master to Louis XV, of a court ball suggests some of this splendor, and also the rigid formality that governed the proceedings. The dances came in a prescribed order, as in the standardized instrumental dance suite established by the lutenists and harpsichordists of Louis XIV's time.

Of the Ceremonial Observed at the King's Grand Ball

I believed it impossible to give a description more likely to inspire regard for the ceremonies and rules of private balls than first to attempt some brief account of the King's Grand Ball, since it is the most important of all such functions and should serve as a model for private balls in regard to the order of the proceedings, and the respect and politeness to be observed thereat.

In the first place, none is admitted to the royal circle save Princes and Princesses of the Blood Royal, the Dukes and Peers, and Duchesses, and afterwards the other Lords and Ladies of the Court according to their rank. The Ladies are seated in front, while the Lords are placed behind them. Nevertheless, I have ventured to represent the latter standing [see the illustration], to avoid confusion in my figures, and to make them more easily seen.

Everyone being thus placed in order, when His Majesty wishes the ball to begin he rises, and the whole company does likewise.

The King takes up his position at that end of the room where the dancing is to begin, which is near the musicians. In the time of the late King [Louis XIV], the Queen

The King's Grand Ball. The
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Maître à danser, Paris, 1725, fa

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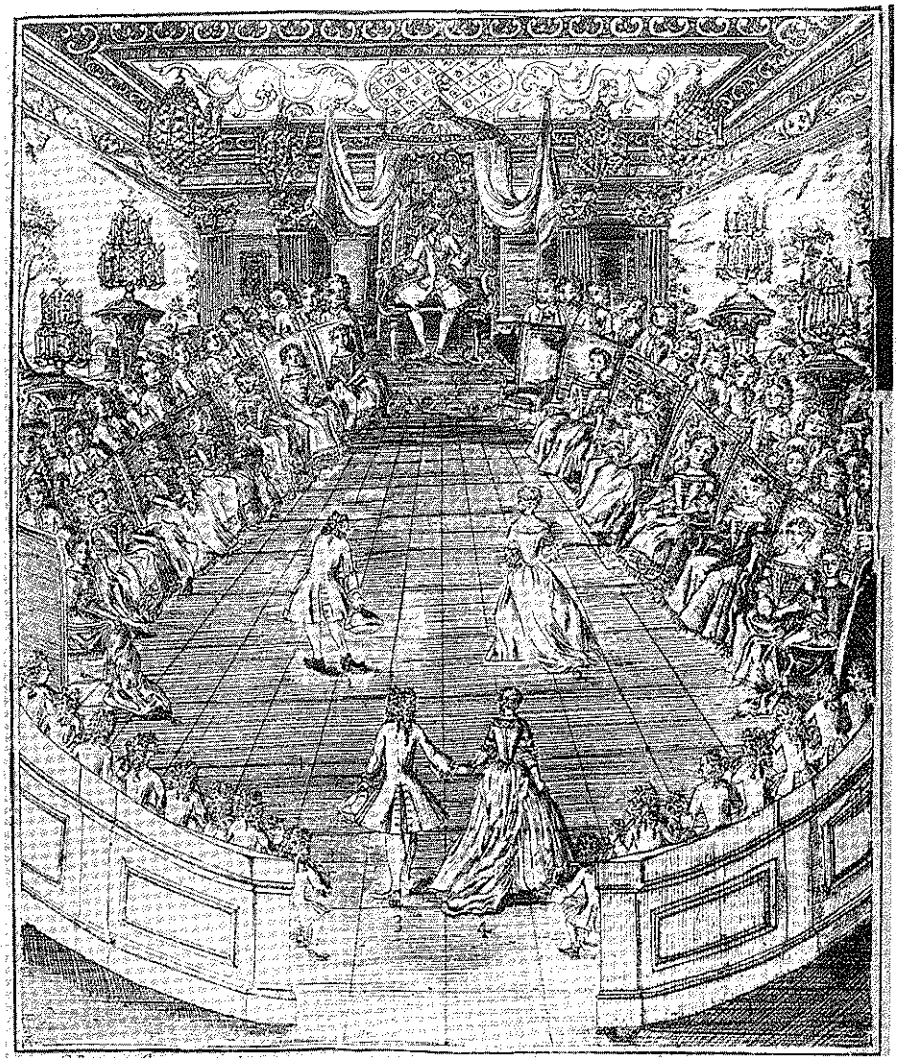

The King's Grand Ball. The musicians are seated at the rear of the ballroom, near the entrance (that is, closest to the reader), the King at the front. The moment depicted is described in the next-to-last paragraph of the accompanying text, where Rameau details the extremely precise protocol that was observed on such occasions. (Pierre Rameau, *Le Maître à danser*, Paris, 1725, facing p. 1. Engraving by the author.)

danced with him, or in her absence, the first Princess of the Blood, and they placed themselves first. Then the company took up their station behind them, two by two, according to their rank. The Lords stood on the left side, the Ladies on the right. Retaining this order, they made their bows in turn. Afterwards the King and Queen led the *Branle* [a dance in which the couples stand in long sets] with which all Court Balls opened, and all the Lords and Ladies followed Their Majesties, each on their own side. At the conclusion of the strain, the King and Queen went to the end of the line, then

the next couple led the *Branle* in their turn, after which they took up their position behind Their Majesties. This continued until all the couples had danced and the King and Queen were at the head again.

Then they danced the *Gavotte* in the same order as the *Branle,* each couple successively retiring to the end of the line. The dance finished, they made the same bows on parting as those with which the Ball opened.

Then came the *danses à deux.* Formerly the *Courante* was danced after the *Branles,* and Louis XIV, of happy memory, danced it better than any member of his Court. But nowadays the *Menuet* is danced after the *Branle.*

Therefore, when the King has danced the first *Menuet,* he goes to his seat and every one sits down, for while His Majesty is dancing all stand. Then the Prince who is to dance next, after His Majesty is seated, makes him a very profound bow, and then goes to the Queen or the first Princess of the Blood, and together they make the same bows as before the dance. Afterwards they dance the *Menuet,* and at the conclusion make the same bows again. Then the Lord makes a very low bow to the Princess on leaving her, because she will not appear again before the King.

But if His Majesty desire another dance to be performed, one of the First Gentlemen of the Bed Chamber announces his wish, which does not prevent the same bows being observed.

Pierre Rameau, *The Dancing Master* [1725], trans. Cyril Beaumont (London: C. W. Beaumont, 1931), 37–39.

55

Rationalistic Distaste for Opera

The French were skeptical of the whole idea of opera during its first century. They possessed a glorious and very intellectualized spoken drama, compared to which the Italian *dramma per musica* seemed a kind of child's babble, in which verisimilitude was impaired, credibility made difficult, and the emphasis placed not on the content of the play but on decorative trappings. Music was admitted to their theaters mainly in an incidental capacity, on a par with the spectacular "machines" on which gods descended or winged chariots took off. And as the great French dramatist Pierre Corneille (1606–84) makes clear in the preface to his *Andromède* (1650), a *pièce à machines,* the machines were far more integral to his conception of that sort of play than the music that accompanied them.

Each act, and the prologue as well, has its own set, and at least one flying machine, with a musical accompaniment which I have only used in order to entertain the ears of the spectators while their eyes are engaged in watching the descent or ascent of a machine, or are focused on something (like the fight between Perseus and the monster) which would prevent their paying attention to what the actors might be saying. But I have been very careful to have nothing sung that is essential to the understanding of the play, since words that are sung are usually understood poorly by the audience, owing to the

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Pierre Corneille, *Œuvres complètes,* I (P

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