

DA VINCI'S MUSIC

Before dealing with this fascinating aspect of Da Vinci, it must be stated that, in the present condition of our knowledge, the figure of Leonardo as a musician is the vaguest among all the images of the many-sided genius that have been left to us. And it should be added at once, for the information of the unspecialized public, that the solution of the problem is of more interest to the musicologist than to the musician. The scientist looking for new light on the history of the art of a little-explored period will profit more by the inquiry than the artist who may hope to find unknown music worthy of the great master. The latter may still hope for discoveries of this nature, but the musicologists no longer hope.

Without further examination, it is hard to believe that Leonardo was a "great musical figure." We know that the period from 1474 to 1519, in which he may have worked practically as a composer, was completely dominated, in the schools and in the official world, by the Flemish masters of what is called the "third period," and in popular art by forms not as well known as they ought to be, which, in any event, were the *frottola*, the *villotta*, the *rispetto*, the *strambotto*, and the ubiquitous polyphonic *canzone*, which was courtly in Italy and France, and spiritual in pre-Lutheran Germany and mystical Spain—in the former marked by the influence of the Meistersinger, and in the latter by troubadour or Moorish survivals, with varying accompaniments played on plucked instruments.

Now, the first printed works of Petrucci, which reflect the fashion of the times in Italy, offer us motets and *canzoni* by De Orto and Agricola, by Okeghem, Josquin, and many other Flemings, as well as by innumerable Italian *frottolisti*, but do not present a single *canzone* by Messer Leonardo da Vinci, a Florentine engineer in the service of the Duke of Milan, who was so well known, so famous in that intelligent and intellectual world to which the well-informed publisher dedicated the *Odhecaton A* and the *Canti B*, the ten books of *frottole*, the lute tablatures, and all the varied production of his print shops at Venice and Fossombrone.

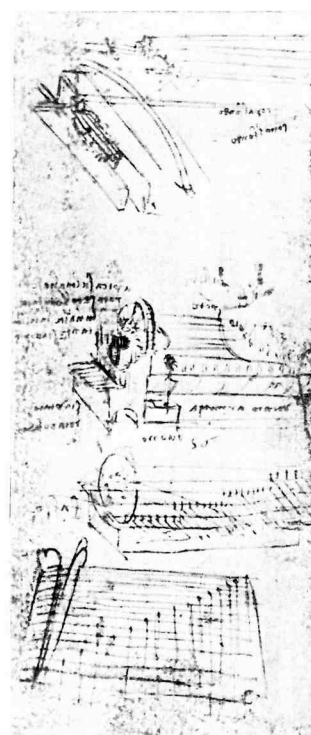
And not only did Petrucci, Antico, and the successors to their printing art not know, while Leonardo was alive, that he was an important musical figure; no more did Attaignant and the other French publishers, who were vigorous revivers of works of the past, recall the great protégé of the king of France ten, twenty, or thirty years after Leonardo had died.

In a word, we are without the most important kind of evidence, printed works; and besides this absence there are circumstances that compel us to interpret it rather as negation than as forgetfulness.

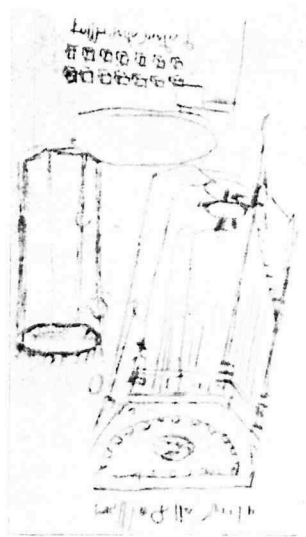
This is a disconcerting beginning for investigation of the "excellent musician" of whom Vasari speaks. But if we overcome our disappointment as musicians and listen to the patient musicologist as he goes to the other sources, in biography and iconography, we find assertions that gradually increase in number and thereby in weight until they come to assume very great importance. Leonardo was not a composer; at least, he did not have the will nor the patience to write. But he knew music, loved it, practiced it, and made an important contribution to it.



Two musical phrases by Leonardo - Windsor, Royal Collection, no. 12697, 12699



Study of mechanical violin conceived by Leonardo da Vinci - Cod. Atl., fol. 218 r-c



Study for "bow" of "viol" - Ms. H, fol. 28 v



"Bow" for "viol" - Ms. H, fol. 28 r



"Bow" for "viol" - Ms. H, fol. 29 r

The biographical sources, summed up by Vasari, tell us that when Leonardo was a youth in Florence, he attended schools of all kinds, besides Verrochio's. We believe it. These sources tell us that he studied music: we do not doubt it. And it is of little importance to us to know whether his teacher was, as Peladan asserts, no other than the great old Squarcialupi, or some other one of the twelve able masters set to teaching music under Medicean auspices.

They say that he made rapid progress: this is accepted without the shadow of a doubt, for it would be astonishing if it had been otherwise. But we are even more willing to believe, without asking for further proof, that he was primarily self-taught in this subject, as in every other.

We believe that he sang with a fine voice, both in polyphonic groups and solo, accompanying himself on the lyre, which he played extremely well. This is an important point that comes to us from Vasari.

We believe that Leonardo played the lyre extremely well; in fact, we believe, because of what we have said earlier, that he played it like an autodidact of genius, better than anyone else.

Did he not sing to his own accompaniment? This statement of Vasari's, fully confirmed in other ways, is supported by the preceding data and confirms them in turn; it enables us to regard it as certain that Leonardo's musical studies were not only "fairly profound," but decidedly so, comprehensive and continuing.

For we must not forget that the accompaniment of singing at the end of the fifteenth century was not and could not be of the very simple type that any dilettante, from the seventeenth century to our times, has been able to perform on the guitar; it was not chord strumming of a harmonic sort. The Camerata at Florence and Grossi da Viadana came almost a hundred years later, and harmony was unknown, even though it existed and governed composition (just as the law of gravity, while it ruled the universe at that time as well, was still unknown as a law).

When Leonardo presented himself to the Duke and Duchess of Milan with his famous horse's-head lyre, the instrumental accompaniment of a *canzone* was contrapuntal in style; it was an arrangement for the instrument (*in chordis*) of the two, three, or four parts in horizontal motion, without which no proper *canzone*, learned or popular, was conceivable before the Florentine revolution of the Casa Bardi. Hence the dilemma: either Leonardo also invented both accompanied monody and the art of accompanying it (and this we do not believe), or else he performed "out of his head," in the 1480's and 1490's, what Franciscus Bossiniensis was to write and give to the press of Petrucci some years later, in 1509.

This is possible. And it says in the clearest manner that Leonardo knew music splendidly, and better than most.

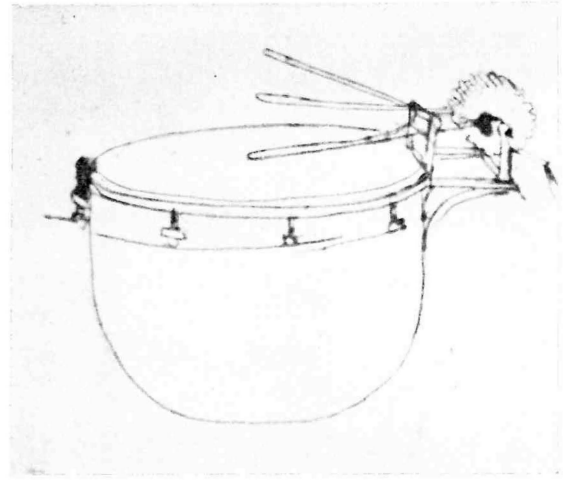
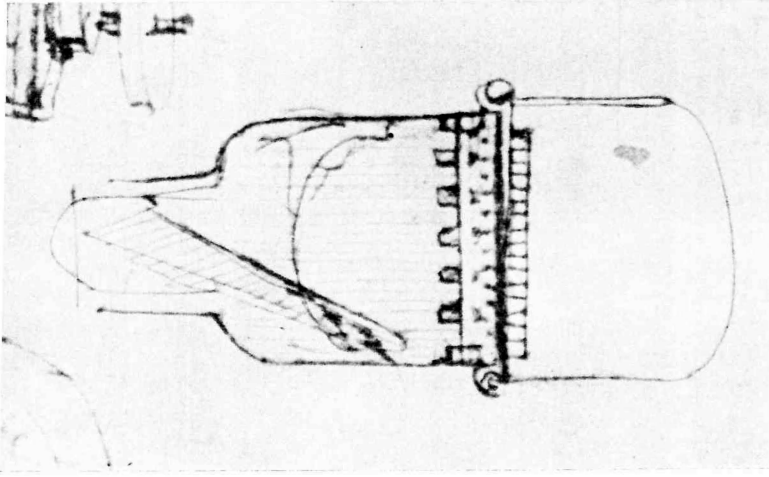
"He surpassed all the other musicians," says Vasari. And how well he puts it! The practice of accompanying song with one or more instruments is a good deal older than Leonardo; it is as old as the singing schools of the Carolingian era. The voice is accompanied at all stages, in unison, in diaphony, with *gemello* and faux-bourdon, with mile-long tenor notes, with free and capricious descants, with canons. But all this was outmoded at the end of the fifteenth century, when people accompanied themselves with Flemish-style contrapuntal imitations. This was the manner, very fashionable in his time, but the most difficult when used for improvisation, in which Leonardo must have accompanied himself when he astounded the audience in the Sforza house. He knew the craft like a master. Vasari, with a single phrase, has enabled us to be sure of it.

We pass to other historical sources. Some assertions in them are obscure or of no significance. They tell us that Leonardo came to Milan (but was it in 1483 or 1494?) bringing with him a pupil, Atalante Migliorotti. But the latter took part, at Mantua, in the first performance of Politian's *Orfeo*, which occurred in 1471. Is it possible that Leonardo brought with him as a pupil an artist who was already well known and who was at least as old as he, if not older?

He is said to have had some other "pupils" and to have been in touch with musicians of some importance—Gusnaschi, Gisiberti, Gian Giani, Gherardini, at Milan, at Florence, at Venice. But this means nothing for our purposes, and is at best tentative evidence.

He served together with Franchino Gaffurio. This is an indisputable fact and of considerable importance. He was very friendly with a family of four lutanists from Lyons called Duiffopruggar (=Tieffenbrucker); and this is information of capital importance, although there is little reliable confirmation of it. His friendship with Gaffurio, his fellow worker in the services of the court and the city, could not but have given rise to academic discussions of the mathematics of sound, and his intimacy with the lutanists could not but have given rise to discourses on the physics and mechanics of sound. This we shall see later. Let us therefore give a passing glance at the pictures decorating the 1490 and 1496 editions of Gaffurio's *Musica practica* (which are so crude that no one could reasonably conceive of attributing them to Leonardo, although some have done so) and at the "portrait of a musician" in the Ambrosiana, which may not even represent Gaffurio, but which at all events was never touched by Leonardo's hand, and go on to Leonardo's drawings, to the iconographic sources and the manuscripts.

It would be in point to start by reading some of Da Vinci's words with reference to music. But we do not believe that those pretty dreams, worthy of a troubadour at the court of Frederick II in Palermo, shed any light on the musicianship of the man who wrote them: "A garden covered



with a net and full of singing birds;" "A mill that gives forth sound as it turns"; and then: "There should be made" fountains in tune. And this, that, and the other thing "should be made." All this is in character for a decadent poet, not for a musician or someone who knows music.

On the other hand, Leonardo's assertions regarding the greater power of visual emotion as compared to auditory emotion, and his often repeated demonstrations of the superiority of painting to the other arts, are philosophical disquisitions that do not give us the right to conclude, as has been done, that the great man had a sort of insensitivity to music. That would not do at all, after the academy in which Leonardo "surpassed all the other musicians!" Let us see what the manuscripts say.

We shall divide the Da Vinci drawings into two categories—those depicting instruments without any other specific purpose, and those which appear to be genuine studies for creating new instruments or modifying old ones. The first kind might include the drawing of the lute player, with the little volume of highly legible written music. But criticism tends to exclude this work from the catalogue of Leonardo's productions. Then we find drawings of the viol, as an entity or shown in its parts, in certain manuscripts. Here some students seem to have gone astray.

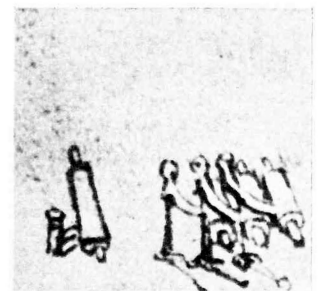
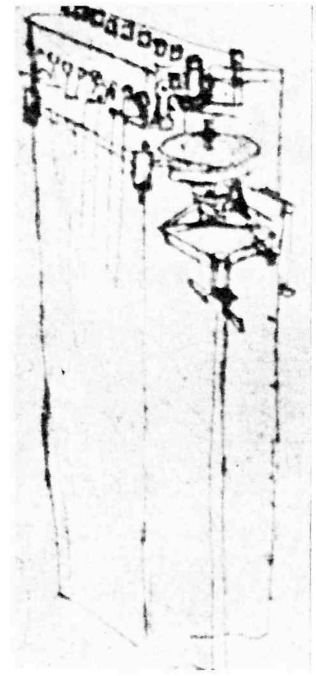
In verbal descriptions of Leonardo's drawings, some writers have gone so far as to state that he designed viols "with a new finger board." The word has betrayed the thought. It has led people who had not seen the drawing, but were familiar with musical terminology and jargon, to imagine that Leonardo tried to change the proportions of the distances between frets, that is, the distances separating the little crosspieces that are found in almost identical form in the lute and its derivatives, and which, on the neck of the old fretted viol, marked off precisely the fractions of the length.

This would immediately give Leonardo a place among the theoreticians of music, beside his contemporaries Gaffurio and Burzio, Pareja and Spataro; but nothing of the kind ever happened. Instead, Leonardo made many studies in an effort to make it easier to handle the keyed viol (*viola a tasti*), or *gironda*, also called *sinfonia* and *lira da orbo* in Italy, *vielle* in France, hurdy-gurdy in England—a wheeled viol, in short, and something very hard to find today, even among old street mendicants.

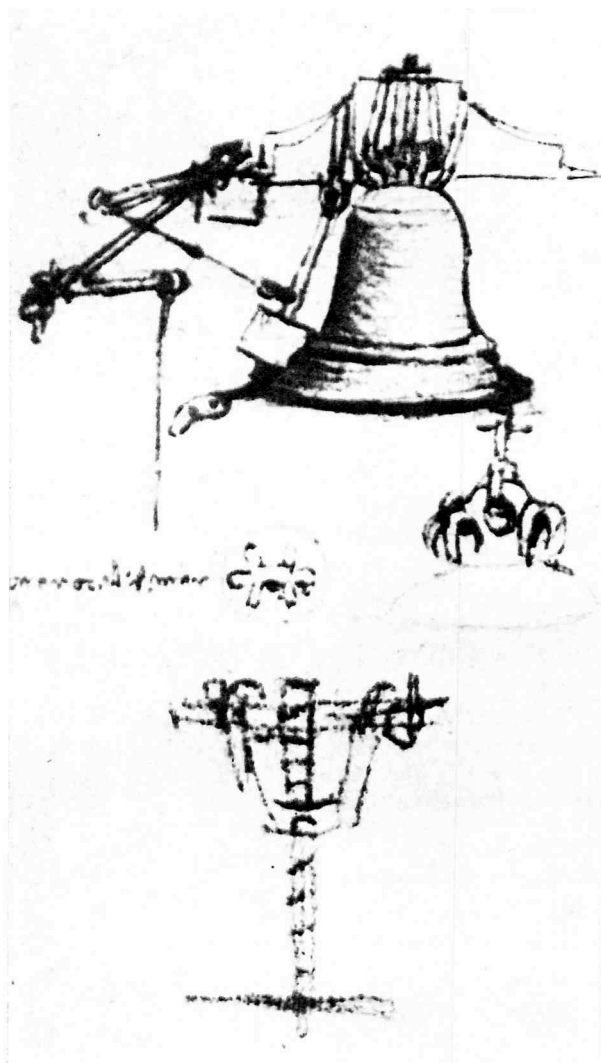
How many times did Leonardo draw the finger board and the box or sound chest of the hurdy-gurdy? Innumerable times—in the Codex Atlanticus, in the Codex Arundel, in all sorts of places. It could be truly said to have been an obsession of his. The matter interested him. We shall go further, and at the risk of hurting the feelings of the sentimental, assert that he was very much interested in it, but from an entirely different point of view than they in their enthusiasm imagine: it was from the mechanical point of view, and within a frame of reference in which all Leonardo's activities as an instrument designer are to be located. He always tended to mechanize the player's performance. Why? Perhaps because replacing the hand made superhuman in the miracle of art seemed to him the supreme and most difficult conquest that the science of mechanics could make. And just as he designs a trumpet with keys, but with the keys arranged like those of keyboard instruments (Cod. Arund., fol. 175 r), and as he draws snare drums and kettledrums equipped with a toothed wheel to make the roll easy and regular, and with a screw to stretch the skin systematically, and as he draws a cylinder with pegs that can perform a canon merely by being turned (in total defiance of the learned composers of rounds, canons, and so-called fugues), just so he draws and draws again the apparatus with frets for dividing the length of the string, the sound box with its jacks and tangents, the finger board of the *viola da orbo*.

Left: Study for musical instrument
— Ms. H, fol. 46 r

Right: Study for mechanical drum —
Cod. Atl., fol. 335 r-c

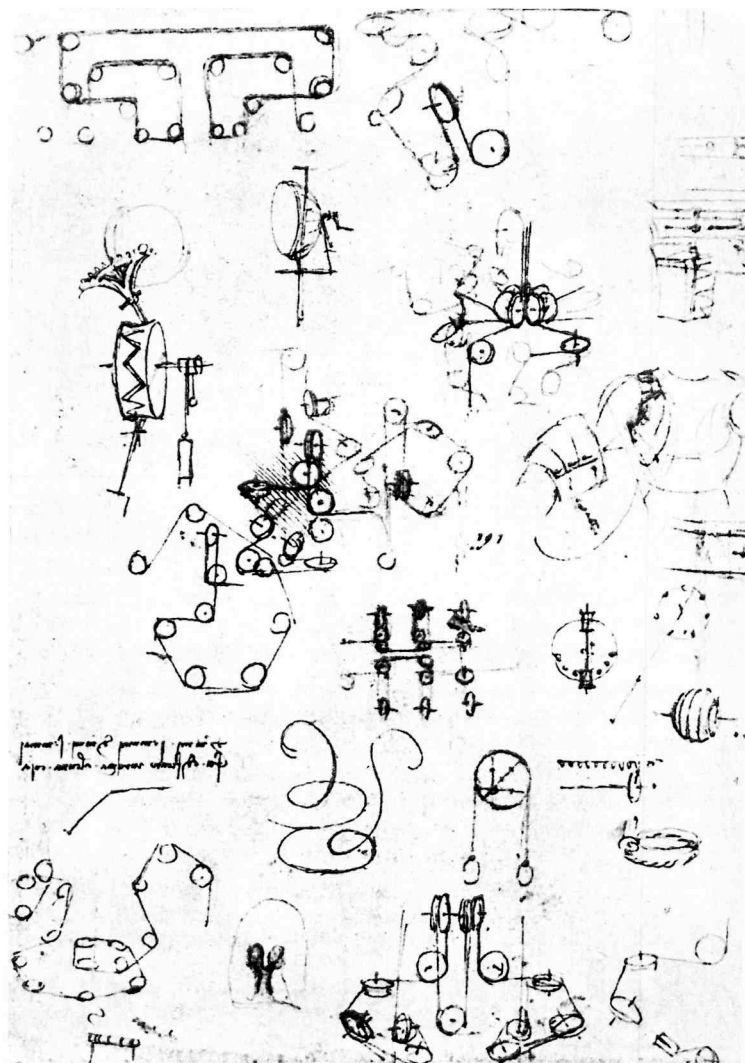


Above, below: Studies for construction of mechanical viol — Ms. H, fol. 45 v



Left: Mechanical hammer for ringing bells - Cod. Forst., II, fol. 10 v

Right: Studies for drums - Cod. Atl., fol. 216 v-b



Clockwork movement for organist viol - Ms. B, fol. 50 v

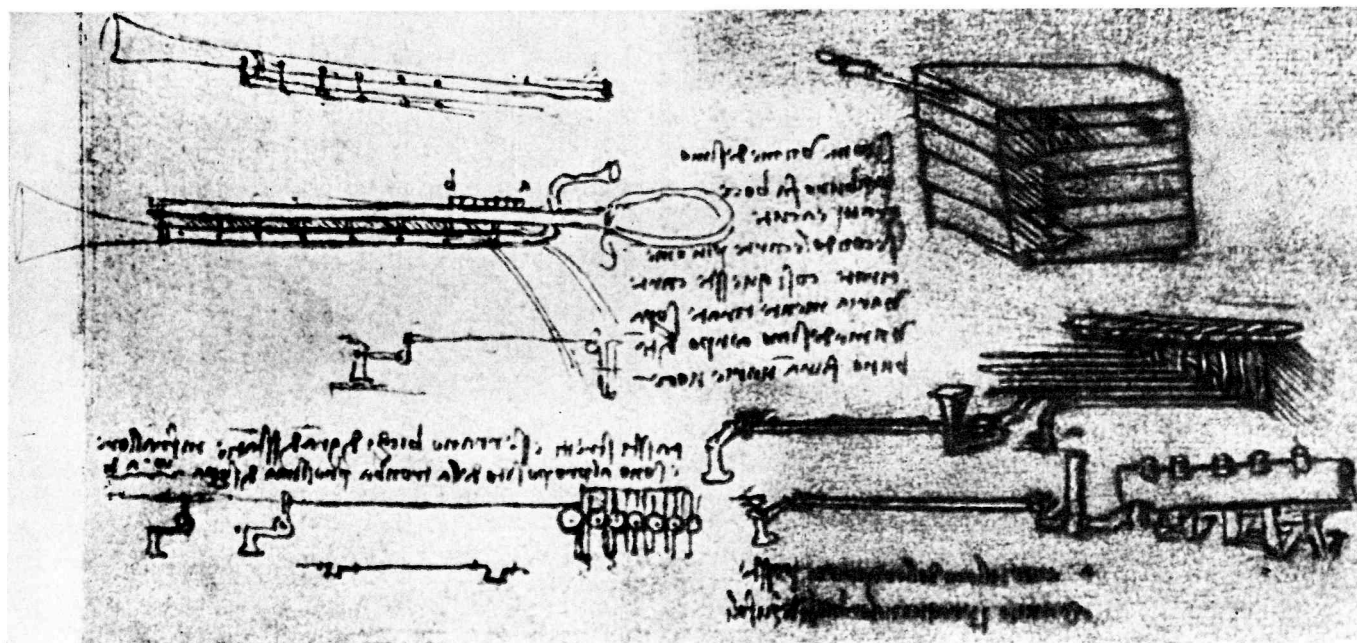
The player may go ahead with confidence and turn the crank, only pressing the keys; the sound will come out much better than before, since mechanics has taken the place of his skill.

The cylinder with pegs, mentioned above, is another of Leonardo's favorite themes. It is to open in order, at the will of the person setting the pegs, the stops of organ pipes (Cod. Arund., fol. 137 v); it is to actuate the clappers of the bells of a carillon; it is to perform a canon with variable time intervals. Twice, unless we have overlooked other cases, he sets up a canon mechanically—once in the Arundel codex and once in the Windsor drawing no. 12697, which is reproduced in the *Enciclopedia Treccani*. In both instances he also writes musical notes; these, on the basis of what we said at the outset, are the only notes from his hand that have come down to us.

The musical reader will prick up his ears at this point and put the challenge: "Is the theme worth anything or not? This is the point at which to test whether Leonardo was a musician and understood composition." We do not have the proof. Our only response to the musician consists in the two themes that might be based on the modern pentatone, and an invitation to resolve the two canons. First, however, a word of advice: there are certain harsh successions that did not frighten the musicians of Da Vinci's period. Second, not all Flemish canons can be resolved without "mutation."

Was Leonardo da Vinci, then, a finished musician? After tests of this nature, there can no longer be any doubt: he was a finished musician. He knew how to state a canon. He did not work it out, perhaps because he had neither the time nor the desire to do so, and perhaps because his mind was dedicated to the mechanical problems involved and suggested in music more than to music as an art.

He planned a new instrument which he called the *viola organista*. He drew it twice on a page of the Codex Atlanticus. With two lines he crossed out the second drawing and condemned it with the word *falso*. Later, he took up the idea again (Cod. Atl., fol. 218 r-c) and brought it to completion with modification which, conceived by a mechanical mind, anticipate one of the most interesting of modern automatic instruments, whose only impediment to being artistic is precisely



that they are automatic. The difference is that Leonardo's "organist viol" is not automatic and, if it had been built, could have become an artistic instrument.

We do not think that a detailed description of Leonardo's organist viol would be in place in this article. The design and a hint or two will suffice. There are two drawings, as we have said. In the instrument shown in the first, the strings are stroked by a wheel; in the final form they are brought into contact with a moving bundle of horsehairs. The finger board brings the given string (mounted on an independent guide) into contact with the horsehair.

The feat most recently attributed to Leonardo is that of having had a share in the invention of the violin. The question may be stated in the following terms. It is asserted that Leonardo not only knew the Duiffopruggar "family" of lutanists, to whom criticism both recently and in the past has been inclined to assign a rather large share in the invention of the violin, but was also very intimate with them. We speak of the "family" and not specifically of the bearded Caspar Duiffopruggar of Voeriot, because, as Mme. Roux Champion asserts, there were four lutanist Duiffopruggars—grandfather, father, son, and nephew. This implies a much longer period of activity as lutanist than has previously been supposed, and makes it possible that a violin was in existence as early as the first years of the sixteenth century. Where was it made? In Milan or Florence, in some household where Leonardo was a frequent guest. And nothing of this sort would have taken place in a house that he visited as a friend without his knowing it; it is impossible that Leonardo, knowing what the lutanist was doing, should not have lent a hand to it, or words or a drawing or advice.

Now we need only find some proof for this gratuitous supposition. Does the famous 1506 violin given to the Emperor Maximilian exist? Did it exist? Did anyone see it? Was it a head by Leonardo that was carved on the violin seen and owned by the lutanists cited by Mme. Roux Champion? Was this instrument a violin or a small viol? Did it have a sound post, bass bar, sloping finger board, and scroll? The scroll itself has been said to be of Leonardian paternity. Does it not have the form of a snail, and is not the snail one of Leonardo's symbols, repeated so many times—appearing, as one instance, in the painting of Leda, in which there are the two *putti* bearing the legend "Caspar" amid their blond curls? These are vague hypotheses; we put them aside.

There is, however, a much more weighty fact, although it comes out of a problem that has not yet been solved. Since the violin was created while Leonardo was alive, who else in his time could have conceived its geometrical construction, and definitely and completely solved that tremendous problem in acoustics? A craftsman like the Duiffopruggars or Bertolotti? It is not desired here to make risky assertions; but there are people who think of Leonardo as the most probable theoretician of the structure of the violin.

We end in the only way possible—by bowing our heads in reverence before the genius who saw and chose what he pleased in every field of thought, heedless of fate and all but heedless of his own creative power, who passed by music and possessed it as if in sport, and, if he endowed it with a gift or gave it a thought, did so by chance or by caprice. The flight of the genius had another goal.

ENRICO MAGNI-DUFFLOCQ

Studies for wind instruments - Cod. Arund., fol. 175 r



Studies for percussion instruments - Cod. Arund., fol. 175 r