

3. Whispers
Murmurs
Grumbles
Buzzes
Bubblings
4. Screeches
Creaks
Rustles
Hums
Crackles
Rubs
5. Percussion noises using:
metal, wood, skin, rock, terra-cotta, etc.
6. Voices of animals and humans:
Shouts, Shrieks, Moans, Yells, Howls, Laughs,
Groans, Sobs.

In this list we have included the most characteristic of fundamental noises; the others are only associations and combinations of these. THE RHYTHMIC MOVEMENTS OF A NOISE ARE INFINITE. A PREDOMINANT RHYTHM ALWAYS EXISTS, AS DOES A TONE, but around them numerous other secondary rhythms are equally perceptible.

CONCLUSIONS

1. Futurist musicians must always enlarge and enrich the field of sounds more. That is, they must respond to the need of our sensibilities. In fact, we notice that in the contemporary composers of genius there is a tendency toward the most complicated dissonances. They always move away from pure sound toward "noise-sound." This need and this tendency can only be satisfied by *joining and substituting noises to and for musical sounds.*

2. Futurist musicians must replace the limited variety of timbres of the instruments that the orchestra possesses today with an in-

finite variety of timbres of noises, reproduced with proper mechanisms.

3. It is necessary for the musician's sensibility, liberated from the easy and traditional rhythms, to find in noises the means to increase and renew itself, since each noise offers the union of the most diverse rhythms as well as its dominant one.

4. Every noise possesses among its irregular vibrations A PREDOMINANT GENERAL TONE. This will be easy to obtain by constructing instruments that imitate a variety of sufficiently wide tones, semitones, and quarter-tones. This variety of tones will not deprive each noise of its characteristic timbre, but rather increase its texture or range.

5. The practical difficulties presented by the construction of these instruments are not grave. When we have found the mechanical principles that produce a certain noise, we shall be able to change the tone, regulating it by the same general laws of acoustics. For example, we shall speed up or slow down the velocity if the instrument has a rotating movement, or increase or decrease the size or the tension of the sound-making parts if the instrument does not have a rotating movement.

6. The new orchestra will obtain the most complete and the newest sonic emotions, not by means of a succession of noises that imitate life, but by means of a fantastic association of these various timbres and rhythms. Therefore, every instrument must offer the possibility of changing pitch and must have a more or less large range of extension.

7. The variety of noises is infinite. If today we perhaps possess a thousand diverse machines and we are able to distinguish a thousand diverse noises, tomorrow, with the multiplication of new machines, we shall be able to distinguish ten, twenty, or THIRTY-THOUSAND DIVERSE NOISES, NOT BY SIMPLE IMITATION BUT BY COMBINATION ACCORDING TO OUR IMAGINATION.

8. We, therefore, invite young musicians of genius and audacity to observe all noises with continual attention in order to understand their various rhythms, their principal and secondary tones. Then, by comparing the various timbres of the noises and timbres of sounds, they will convince themselves that the first are more numerous than

the second. This will not only give them comprehension of, but also a taste and passion for, noise. Our multiplied sensibility, after being conquered by Futurist eyes, will finally have Futurist ears. Thus motors and machines of our industrial cities will one day be skillfully tuned in order to make every factory an intoxicated orchestra of noises.

Dear Pratella, I submit to your Futurist genius these new ideas of mine, inviting you to discuss them. I am not a musician; I, therefore, do not have acoustic predilections or works to defend. I am a Futurist painter who projects beyond himself on a much-loved art his own wish to renew everything. That is why, being bolder than if I were a professional musician, unpreoccupied by my apparent incompetence and convinced that audacity has all rights and all possibilities, I have been able to perceive by intuition the great renovation of music through the Art of Noise.

LUIGI RUSSOLO

The Futurist *Intonarumori*

(May 22, 1913)

On June 2, [1913¹] at a Futurist evening in Modena before 2,000 people who overcrowded the Teatro Stocchi, I explained and demonstrated one of the first *intonarumori* instruments invented and constructed by me in collaboration with the painter, Ugo Piatti. The perfect function of this apparatus or instrument (that has the special name of exploder), reproducing by a series of 10 whole tones the characteristic noise of a motor starting up, provoked violent enthusiasm and at the same time—like everything about our forceful movement—infinite discussions, and, naturally, bursts of imbecile or superficial laughter.

After having read numerous and diverse comments about the "Art of Noise" (March 11, 1913) that have been published principally by foreign newspapers—from *Temps* to *Matin*, from *Berliner Tageblatt* to *Neues Wiener*, from the *Daily Chronicle* to the *Evening Standard*—I was persuaded that all these newspapers have not understood in its essence, however clearly enunciated, the intuitive principle of that manifesto, and what should have been the practical realization that must have been logically derived from the principle.

Several—the major part—have imagined only a cacophony as a practical result; a deafening and disorderly medley of noise without sense or any logic; others have imagined a simple imitative or impressionistic intention to copy the noises of life. Lastly, others have seen in that manifesto only the desire to launch sentences and snobbish theories to amaze the good bourgeoisie.

All this, naturally, did not discourage me and it also did not hide from me the many and grave difficulties that must be overcome

¹ The fact that the event discussed occurred *after* the official date of the article (published in *Lacerba* on July 1, 1913) is another indication of the casualness with which the Futurists dated their writings.—Ed.

in order to arrive at a practical realization of the manifesto. I continued to work and to do research on the subject.

If from afar I heard and still hear laughter, jokes, or expressions of incredulity about my idea, near me, instead, I have had and have among my old and new Futurist brothers an atmosphere of rousing enthusiasm.

I will point, first of all, to the enthusiasm and to the inexhaustible young faith of that great animator who is my dear and great friend, Marinetti, who is still vibrating from the great acoustic emotion of his experience assisting in the siege of Adrianople.

In my long and patient laboratory research I have had and I have a faithful companion, an ingenious and untiring researcher, the painter Ugo Piatti.

What I said in the manifesto, "We want to intone and regulate harmonically and rhythmically these extremely varied noises," is today a reality, and the instruments that realized the "intoned noises" are, by now, incessantly multiplying them.

Without going into the particular techniques, I shall briefly point out the practical results already obtained and those that are deemed to be possible in a short time by already completed studies.

Acoustics has taught us very little, since, having been applied to the study of pure sounds until now, it has almost completely neglected the study of noise.

Except for several general laws on sounds that also serve in part for noise, acoustics had to proceed almost uniquely by means of continual and repeated experiments.

Above all, it was necessary for practicability for these *intonarumori* instruments to be of the greatest simplicity possible and it is this, exactly, that we have succeeded in perfectly.

It is enough to say that a single taut diaphragm suitably placed gives, by variation of its tension, a gamut of more than 10 whole tones, with all the passages of semitones, of quarter-tones and also smaller fractions of tones.

The preparation of the material for this diaphragm by means of special chemical baths varies according to the timbre of noise that one wishes to obtain. Then, by varying the means of excitation of the

same diaphragm, one also can obtain a different noise, *in type and in timbre*, always preserving, naturally, the possibility of varying the *tone*. There are four different means of excitation used before now and the corresponding instruments have already been completed.

The first gives the sound of *exploding*, automobile-motor type; the second gives a *crackling* sound, the fusillade type; the third gives a *humming* sound, the dynamic type; the fourth gives the sound of different varieties of *rubbing*.

In these instruments it is enough that the simple shifting of a graduated lever gives the tone of noise that one wants, also its smallest fraction. The rhythm of every single noise can also be equally regulated, so one can easily calculate in bars the even and uneven tempos that exist.

These instruments, because of their extreme simplicity, are already perfect enough so that they need only small modifications of a secondary nature.

The research to obtain noises (always, it is well understood, tunable) of the first series listed in the manifesto is now already complete: the "Roars," "Thunders," and the "Bursts"; of the second series: the "Hisses"; of the third: the "Bubblings"; of the fourth: the "Screeches" and the "Rustles." The relative instruments for these noises are already in execution: the "Roarer," "Thunderer," "Burster," and the "Bubbler."

And now I shall say some words about the effects that noises thus intoned produce on those who listen.

As I pointed out in the manifesto, noise that comes from life we immediately restore to the same life (contrary to that which makes the sound) reminiscing quickly in our minds about the things that produce the determined noise that we hear. The restoration to life has, therefore, a character of an impressionistic fragmented episode of the same life. But as in every art, and thus also in the Art of Noise, we must not limit ourselves to an impressionistic fragmented reproduction of life.

Noise must become a primary element in shaping the work of art. That is, it must lose its own accidental character in order to become an element sufficiently abstract so that it can reach the neces-

electric sign into the house across the street *yellow slaps* for that gouty, dozy bibliophile in slippers 3 mirrors watch him the sign plunges to 3 redgold abysses open close open close 3-thousand meters deep horror quick go out out hat stick steps taximeter push shove *zuu zuoou* here we are dazzle of the promenade solemnity of the panther-cocottes in their comic-opera tropics fat warm smell of music hall gaiety = tireless ventilation of the world's Futurist brain.

LUIGI RUSSOLO

Enharmonic Notation for the Futurist *Intonarumori*

(March 1, 1914)

The total conquest of the enharmonic system obtained by Futurist *intonarumori* has rendered several modifications in the current system of musical notation necessary (as written in the November 21, 1913, issue of *Lacerba*).

This system, in fact, as it is today, only considers the subdivision of semitones, whereas the *intonarumori* can produce any fractions of tones. It is necessary, therefore, to find an easy and simple means to indicate these subdivisions, in other words, the means to write down *enharmonic music*. Different systems of present musical writing were proposed on several occasions but quickly dropped because of their uselessness or their impracticality.

A system that is certainly logical and rational is a musical notation using numbers, calling 1 the first grade of the scale, and 2,3,4,5,6, and 7, the successive grades. But this system, though logical in appearance, became enormously complicated and was above all slow and difficult to read, because of the fact that the eye, finding itself in front of a page completely filled with numbers, must read these figures one by one identifying them with the grades of the scale, without the arrangement of these numbers helping to accelerate this operation.

Thus it happens that, although it is enough that a very rapid glance at a musical page having the usual staff gives one a complete idea of the degree of the music's harmonic and rhythmic complication, a musical page written with a system of numbers teaches one nothing except that one has not read it all, identifying them number by number. And this happens because the usual system of musical notation forms a variable and characteristic *arabesque* with dots and lines placed at various heights on the staff. This arabesque, with its complete form, greatly helps us to identify immediately the

music that we are reading and to transform it in our minds into music that we hear.

There is no one who does not see the decisive importance of a system of musical notation giving the possibility of rapid and easy reading, and I quickly rejected ciphered writing. I was thus able to resolve the difficult problem of enharmonic notation by preserving the current staff and only varying the form and the means of indicating the notes on it.

It was not, therefore, necessary to vary the number of lines as others had proposed, since the result, even if logical sometimes (e.g., the whole tone written on a line, the semitone written in a space) was the inconvenience of overenlarging the space occupied by one octave. This created the necessity, therefore, of numerous transfers to the octave above or below.

In this entire course through the various systems of musical notation no one found anything that might have suggested the precise purpose of notation for enharmonic music. And this was logical. What purpose was there in creating a system of enharmonic notation if the instruments for performing enharmonic music did not exist? And wasn't it the realization of enharmonic music by the Futurist *intonarumori* that has rendered the relative system of writing indispensable?

At present, it is necessary to observe that enharmonic music as a total system and as being performed by the *intonarumori* has as its characteristic the possibility not only of fractionizing the interval of a tone into a given number of sounds, but of giving precisely the *change* from one tone to another, the sliding, as one could say, that a tone makes in order to arrive at the tone immediately above or immediately below it. This dynamic passage is not logically divisible, as a shading of a color from light to dark is divisible. If it were possible to establish the stages, that is to say, the degrees of fourths, or of eighths, etc., of a tone, still in doing so it would thus break the *dynamic continuity* of the tone.

Dynamic continuity This is the essence of enharmonic music; this is the difference between it and music of a diatonic-chromatic system, which could, instead, be called *intermittent Dynamism*, or more correctly perhaps, *fragmentary Dynamism*.

Now, if a series of *dots* has served very well to indicate the stages and grades of sound in the diatonic system, what can give continuity to this sound if not the *line*?

Thus, we have exactly reported the value of the dot (fixed and static principle) and the value of the line (dynamic development) to explain exactly the values of the diatonic system in respect to the enharmonic system and to represent it in a logical and perfect way.

The development, therefore, of a line, its rise or its fall on the lines of the staff, will indicate to us in a logical, easy, immediate way the development, the rise or the fall of the tone of sound-noise.

The length of this line, enclosed between vertical lines, will give us the length or duration of the same sound, its absence will give us the pauses equally limited by vertical lines, according to their duration. These lines, which thus indicate the development of one or more sounds, form an arabesque that immediately gives a characteristic appearance to a given composition, rendering it easy to read rapidly.

It is easier and even more rapid than the current writing, since while the whole note or the half-note are no longer for the eye than a quarter-note or an eighth-note, in this new notation, instead, a whole note (that is to say, a value in time corresponding to a whole note) will be better represented because the line is really longer than that of a half-note or an eighth-note.

In the new notation, therefore, we will have:

Instead of empty or full dots that indicate the notes, a line that we shall call a "line-note" and that will run on five lines and will indicate the tone according to the line or the space on which it is written. The reading will always be related to the two clefs, G of the treble or F of the bass, that will be indicated at the beginning of the line. This line will be intersected by thin vertical lines (like the present ones that indicate the bar) that indicate, instead, the quarters of the bars and, by equally vertical but wider lines (or by two close thin ones) that indicate the bars.

For the subdivision of time smaller than a quarter of a bar,

there will be used similar vertical lines, but shorter than those that indicate the quarter of a bar.

The line-note will naturally be able to go beyond the five lines in order to indicate the notes that are above or below the same lines. These notes will be identified by means of the usual thin, small, horizontal lines that indicate notes above or below the five lines. For greater clarity, the notes that are above the line, those, that is to say, that are above the top line, will be indicated by a small bar that will cross the line-note.

Imagine now, a line-note that goes from E, first line (treble clef) and that rises until E, fourth space. This line-note will not only indicate all the tones and intermediate semitones in this manner, but all the subdivisions of the tone. That is, it will give the dynamic and complete shading of the whole octave in an exact way graphically.

It is, however, necessary to have a graphic means to indicate the divisions that can be established between one tone and another.

We can divide the tone into four parts. The way to indicate these quarters will be by dots that we will put above (if it is necessary to raise the note) or under (if it is necessary to lower it). Thus, a dot will indicate a quarter-tone, two dots will indicate two quarters, in other words a semitone, and will correspond to sharps and flats. Three dots will indicate three-quarters of a tone.

Then, if it is desired to divide the tone into eighths, it will be possible to place a small number over or under the line-note, always using this number as the numerator of a fraction that will have as its denominator the eighth-note, thus a three means $3/8$, a five $5/8$, etc.

With this system we can therefore indicate any fractions of time and also give by exact graphic means that *dynamic continuity* of a changing sound.

This dynamic continuity and the possibility of a great variety of timbres are the two most important conquests that the *intonarumori* have accomplished in the nature of means of expression. The two pages of enharmonic music reproduced here that I have taken from *Awakening of a City (Risveglio di una Città)* will give a clear idea of the new notation devised by me.

FRANCESCO BALILLA PRATELLA

The *Intonarumori* in the Orchestra

(May 15, 1914)

It is already almost a year since I should have answered the manifesto on the "Art of Noise" that my dearest friend and ingenious Futurist painter Luigi Russolo dedicated to me.

If until today I have not said anything officially, it is because I still have not found anything bad to say on the subject. Instead, I have thought very profoundly and above all else I have worked.

That is, I now grant myself the joy of offering to my friend Russolo a fresh, fresh novelty: the introduction of his *intonarumori* into my orchestra.

The *Trial of a Mixed Orchestra*, which one sees published in this issue of *Lacerba*¹ shows in synthesis the counterposition of a group of *intonarumori* in a formed mass of other musical instruments.

Exploders and *Buzzers*: the clearly and precisely written parts are in their duration and in their loudness and variety of intonation relative to each *intonarumori*. The other instruments of the orchestra are on *trial*, notated, according to custom, on two single staves, thereby rendering the execution of the music on the piano possible.

As one well sees, the *intonarumori* lose, in practice, some sense of objective reality; they part from an objective reality. By getting away from it immediately, they construct a new abstract reality—an *expressive abstract* element of a state of mind. Their *timbre* does not unite itself with the other *sonorous elements* like heterogeneous material, but unites itself as a new *sonorous, emotive, and essentially musical element*.

¹ Anno II, No. 10 (May 15, 1914).—Trans.