

# WEIRD BEDFELLOWS: ■

## THE ALLIANCE BETWEEN SUPERSTAR OPERA SINGERS AND RIGHT-WING PRESIDENTIAL ASPIRANT

### ■ LYNDON LAROUCHE

Pavarotti, Caballe, Domingo, Freni, Kraus, Tebaldi, Di Stefano, Nilsson, Bergonzi, Cossotto, Cappuccilli, Sayao, Schreier, Cruz-Romo, Ruggero Raimondi, Ludwig, Moll, Edda Moser, Rothenberger, Chailly, Gavazzeni—what do they have in common? They have joined cause with Lyndon LaRouche. They support legislation he has had introduced before the Italian Senate to lower the diapason—the pitch used for tuning—from A=440 to A=432 vibrations (cycles) per second.

The performers may or may not be aware that LaRouche, three times a U.S. Presidential candidate, has been characterized in the American press and by major labor unions as anti-black, anti-Catholic, anti-Chinese, anti-homosexual, anti-labor, anti-Semitic and neo-Nazi, that he is said to be connected to the Klan, that he is the alleged mastermind behind brown-shirt-type attacks, or that he is serving a 15-year prison term for conspiracy to defraud the Internal Revenue Service and (in the words of *The New York Times*) “conspiracy to commit mail fraud involving more than \$30 million in defaulted loans, and 11 counts of actual mail fraud involving \$294,000 in defaulted loans.” (Six LaRouche confederates are in jail for related crimes.)

None of the performers has spoken about LaRouche’s legal battles or his politics. But a number of them attended a conference hosted by his Schiller Institute in Milan, in April, and the others sent letters and telegrams of support. They would all like the following enacted into law:

#### PROPOSED LEGISLATION AND PETITION for the return to THE CLASSICAL PITCH OF C = 256 HERTZ

Given that

The continual raising of pitch for orchestras provokes serious damage to singers, who are forced to adapt to different tunings from one concert hall or opera to the next, thus altering the original texture and even key of the works they perform;

Given that

The high standard pitch is one of the main reasons for the crisis in singing, that has given rise to “hybrid” voices unable to perform the repertoire assigned to them;

Given that

In 1884, Giuseppe Verdi had the Italian government issue a decree establishing A = 432 cycles (corresponding to middle

C = 256) as the “scientific standard pitch,” correctly stating in a letter to the government Music Commission that it was absurd that “the note called A in Paris or Milan should become a B-flat in Rome”;

Given that

Even for many instruments, among them the Cremona violins, ancient organs and even the piano, modern high tuning is deleterious, in that it does not take physical laws into account;

The undersigned demand that:

The Ministries of Education, Arts and Culture, and Entertainment accept and adopt the normal standard pitch of A = 432 for all Italian music institutions and opera houses, such that it becomes the official Italian standard pitch, and, very soon, the official standard pitch universally.

Tebaldi, Nilsson, Freni, Cossotto, Chiara, Sayao, Cruz-Romo, Di Stefano, Schreier, Cappuccilli, Ruggero Raimondi, Chailly and Gavazzeni, among hundreds of other singers and instrumentalists, have signed the petition. As a result of the petition, a bill has been introduced into the Italian Senate by two Senators, Pietro Mezzapesa and Carlo Boggio (Christian Democrats), with the co-sponsorship of the Schiller Institute.

Two of the bill's premises are demonstrably false: A = 432 cps does not correspond to C = 256 cps, and, as is made clear in "Changing Your Tune," herein, the pitch has not been continually rising. Verdi did for a brief time endorse A = 432, only because he went along with a government report founded on a mistake. There is no evidence that he "had the Italian government issue a decree" prescribing A = 432 or that, as the Introduction to the Bill asserts, he had "vociferously requested" it.

Supposedly, LaRouche himself unearthed an 1884 document apparently published by the Italian Ministry of War, "Instructions for the Application of Acts Nos. 153 and 154 from the Military Journal of 1884 About the New Standard for Tuning." It sets forward instructions for adapting instruments to A = 432 and offers a price list for instrument accessories. He also dug up an 1884 monograph, "On the Choice of a New Standard of Tuning for the Royal Army's Music and Fanfares." (No author's name is given.) The monograph includes a report from a government commission, also a letter, dated February 10, 1884, from Verdi:

Since the diapason of A = 435 was adopted in France, I advised that we should follow the example and formally asked orchestras in various Italian cities, as well as that of La Scala, to lower their tuning pitch to conform to the French standard. *If, because of mathematical exigencies, the Commission on Music instituted by our government believes that we should reduce the 435 vibrations of the French tuning fork to 432, the difference is so small, almost imperceptible to the ear, that I associate myself with*

*this most willingly.* [Emphasis added.]

It would be an extremely grave error to adopt, as Rome proposes, a tuning pitch of 450!!! I am of your opinion that lowering the tuning pitch takes nothing away from the sonority and brio of the execution; on the contrary, it gives something more noble, full and majestic, which could not be given by the shrieks of an overly high tuning fork.

For my part, I would like one single tuning pitch to be adopted for the entire world of music. The language of music is universal: why then should the note that has the name "A" in Paris or Milan become a B-flat in Rome?

(In the translation of the letter published on June 10, 1988 in LaRouche's magazine *Executive Intelligence Review*, a passage was tacked on to the letter as though it were by the same author when in actuality it was adapted from the commission's report. In essence, *EIR* tried to make us think Verdi gave an emphatic endorsement, whereas in reality he left the decision whether to fix the diapason at 432 to the commission's discretion.)

What the Schiller Institute was either unaware of or chose to ignore is that in 1886, a year after an international conference in Vienna endorsed A = 435, Verdi reverted to allegiance to that pitch. (In 1871, for the Scala premiere of *Aida*, he had insisted on "the standard diapason"—presumably the "French A" of 435—afterwards demanding that other theaters follow the example.) *La gazzetta musicale* reported on November 14, 1886 that

Verdi has taken a particular interest in this question, supporting the universal adoption of the *only standard pitch*, as recently sanctioned by the Conference in Vienna . . . Now we learn that Maestro Verdi, who prefers actions to all the interminable discussions, has decided that *Otello* can only be performed in theaters where the *standard pitch* is in use; and he has made this an absolute condition for his publisher, who will not otherwise be able to grant permission for a performance.

Boito had participated in the conference, and Verdi had written to him (on November 8, 1885) as follows:

Principal goal: *The Unity of the Diapason*. Give in if you cannot do otherwise—but not without [first] declaring openly, loudly and

publicly that from the scientific point of view a diapason of A 435 is an error. You speak clearly and distinctly and will easily present the truth.

With the authority of our conservatories, it could very well be declared that we retain the diapason of 432 because it is more correct; but such firmness might seem like stubbornness and [the sort of] childishness that could almost lend itself to ridicule and that your friends on the other side of the Alps would immediately seize upon.

Conclusion: *Give in, I repeat, if you cannot do otherwise; and the Unity, etc.*

Write to me about the outcome of it all from Vienna . . . [This and the preceding quote are reprinted from Verdi's *Otello and Simon Boccanegra (Revised Version) in Letters and Documents*, edited and translated by Hans Busch, Oxford University Press, New York, 1988, Volumes II and I, respectively.]

Verdi believed A = 432 to be a scientific diapason because of the claims of the Italian government commission. However, the commission had mistaken mathematical convenience for science; its finding was based on a misconception. (For the particulars, see "Pitch Putsch," herein.)

As it happens, the monograph does not in the least support the Schiller Institute's contention that in the 19th century the world used lower-pitched standards for tuning. Instead, it states that "the principal diapasons in Europe are between 448 and 451 cycles . . . and on account of the pretensions of certain celebrity singers reach as high as 458 cycles (an unofficial Belgian diapason)." Nor do the Schiller Institute's documents support the claim, put forward on May 28, 1988 on my radio show by Institute spokesman Jeanne Percesepe (a.k.a. Jeanne Bell), that Mozart "argued for tuning between A 432 and A 435." On the contrary, the Schiller people now assert that Mozart's tuning fork vibrated at A 427. In actuality, the only known Mozart fork is at 421.6—a value approximated in a table of diapasons accompanying the Introduction to the Bill.

The petition and the Introduction to the Bill repeat the monograph's claim that A = 432 "corresponds to" C = 256. However, a radio listener, Robert Rusk, debunked that: A = 432 is consistent with C = 256.869; C = 256 is consistent with A = 430.539. The bill's advocates

## Tebaldi Runs for Parliament as LaRouche Candidate

As we went to press, word came that Renata Tebaldi and Fedora Barbieri had announced their candidacies for the European Parliament in the June elections. They are running on the slate of LaRouche's Patriots for Italy party.

## Verdi and the A

In 1862 Verdi told Rossini that "a standard diapason was useful and desirable," but that a diapason of  $A = 435$  cps was too low.

In 1871 Verdi stipulated that La Scala perform *Aida* at "the standard diapason"—presumably  $A = 435$ .

In 1884 Verdi endorsed an Italian government commission's recommendation that the A be lowered to 432.

In 1886 Verdi stipulated that *Otello* be performed at  $A = 435$ .

are actually favoring two incompatible standards at once. (See "Pitch Putsch.")

LaRouche's wife, Helga Zepp-LaRouche, stated in her keynote address to the conference, "All classical composers, from Mozart through Verdi, wrote their works for a tuning corresponding to middle C set at 256 cycles . . . Their instruments were all tuned to  $C = 256$  cycles per second." This is nonsense. Furthermore, I am not aware that *any* orchestra or opera house ever tuned to  $A = 432$ , much less, to  $C = 256$ —not before, during or after the 1880s. (Were someone to come up with a documented counterexample, it would be an isolated case and 432 would remain inauthentic for the rest of the repertory.) Even in Italy, except by music conservatories, the commission's report was largely ignored. In 1887, 1888 and 1936, the Italian government issued decrees in favor of 435—which also, for the most part, went unheeded.

Two of the Schiller Institute's key people, Liliana Celani and Giuseppe Matteucci, interviewed Tebaldi for two LaRouche magazines, the West German *Ibykus* (founded by Helga Zepp-LaRouche) and *Executive Intelligence Review*. Celani and Matteucci declared, "All the wind instruments were changed in 1884," presumably to accommodate a change in the diapason. But where are the instruments and what were the alterations?

Helga Zepp-LaRouche seems muddled about the extent of the difference between  $A=440$  and  $A=432$ . She de-

clared, "If, from the musical context, a different tone color, in a different register, is called for on F-sharp, and if the piece is instead played at  $A=440$ , the new tone color arrives prematurely, namely at F-natural." From this statement and others made at the conference, it is evident that she and the singers all imagined the difference between 440 and 432 to be a half-step. In reality, a half-step down from 440 is 415.3. Montserrat Caballe made a similar mistake when she said, "I recall a performance of *Norma* in 1976 at La Scala here in Milan: we began at 444 and in the last act we ended up at 446 . . . the tuning was half-a-tone higher than prescribed by the composer." (Caballe didn't say who measured the frequencies.) Admittedly, I have no documentation for the year *Norma* premiered, 1831. But in 1834 the diapason was at 440 at some important centers, leading a Stuttgart congress of physicists to recommend it as the standard. Moreover Bellini, in his voluminous correspondence, never expressed a preference about the matter. Speaking on my program, Percesepe characteristically thought pitches to be much closer in terms of cycles per second than they really are, maintaining, for example, that "in Europe . . . the pitch goes as high as 460, close to one-and-a-half-steps higher than the composers intended, so that a soprano's high C in Verdi's time would be a D-sharp now." In actuality, 460 is less than a half-step higher than 440—one-and-a-half-steps higher than 440 being 523.251. (In any event, no one today tunes remotely as high as 460.) The bill's proponents are clamoring to change something they don't understand.

Since so many eminent performers favor the bill, why not make it into law? For one reason, because there is something oddly dissonant between such laws and democracy. Totalitarian regimes from Stalin to Hitler have circumscribed artistic freedom. LaRouche is trying to do the same thing—aided and abetted by the performers themselves! For another, because, for music written after the very beginning of the 19th century, lowering the diapason would diminish the brilliance and excitement.

The performers don't see it that way.

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*Irrespective of authorship, the bill should be defeated.*

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They view themselves as striving to be true to the performance practices of the time. Despite massive evidence to the contrary, they continue to accept as an article of faith that pitch was lower in the 19th century than today. In reality, it was as much as three fifths of a half-step higher (see "Changing Your Tune").

Cappuccilli justifies lowering the A by contending that today's diapason causes certain passages in Verdi to lie in the passaggio, whereas with a lower diapason they sit below it. To maintain control over notes in the passaggio, he has to "cover" them, involving switching to a darker, more muffled sound, sometimes in the middle of a phrase. However, the vocal techniques of Cappuccilli and the others are different from those of Verdi's day. Nineteenth-century singers weren't obsessed with the passaggio. In reviews, correspondence and voice manuals of the period, little is said about it. Passaggio problems on a large scale came about as a consequence of "mask" placement—used by all the celebrity supporters of the bill. Nineteenth-century singers didn't have to resort to covering to negotiate the passaggio. In any case, they coped with vocally inconvenient notes by rewriting and transposing. My own feeling is that, in general, passaggio problems should be viewed as challenges to the performer, not as grounds to compromise the music.

The singers' motivation is obvious: vocal convenience. LaRouche would no doubt find it useful to bring about any legislation, even on a "soft" issue. Victory on a cultural issue would confer some credibility and respectability, and all those celebrity endorsements won't hurt.

LaRouche's motivation also has to do with the murky metaphysics underlying all his views, involving "the laws of the universe." At the Milan conference, LaRouche ideologue Jonathan Tennenbaum delivered a paper called "C=256: Foundations of Scientific Tuning"—a document rich in *ex cathedra* assertions

and unwarranted deductions, poor in coherent arguments. Here are some key points:

Living processes are characterized by a very specific internal geometry, whose most direct visible manifestation is the morphological proportion of the GOLDEN MEAN. In elementary geometry the Golden Mean arises as the ratio between the side and diagonal of a regular pentagon . . . The Golden Mean naturally forms what we call a self-similar geometric series—a growth process in which each stage forms a Golden Mean ratio with the preceding . . . Since music is the product of the human voice and human mind, living processes, therefore everything in music must be coherent with the Golden Mean . . . Circular action is the maximally efficient form of action in visible space, and therefore coheres uniquely with the bel canto musical tone and the beam generated by a laser . . . The rotation of the Earth is a “G” 24 octaves lower than C 256! [Tennenbaum has botched his claim; see “The Kepler connection,” in “Pitch Putsch.”] Similarly, C 256 has a determinate value in terms of the complete system of planetary motions. A 440 is an insane tuning in the rigorous sense that it bears no coherent relationship with the Universe, with reality . . .

As our soprano sings upward, two important events occur. First, our soprano must make a register shift, at F-sharp, in order to maintain the “isoperimetric,” least-action form of bel canto tone . . . The second event occurs upon arrival at the octave, C 510 [sic—let’s assume he means C 512]. We hear very clearly that ONE CYCLE OF ACTION has been completed, like a 360-degree rotation. Aha! This proves that there is a ROTATIONAL component of action to increase the frequency of energy flux density . . . Now, it is easy to verify that the solar-system register-shift falls exactly in the same geometric-mean position as the shift of the soprano voice in the proper C 256 tuning . . . If we compare the planetary spiral with our simple spiral derivation of the equal-tempered system, letting the interval from Mercury to Neptune-Pluto correspond to the octave C-C, then the planetary orbits correspond exactly in angular displacements to the principal steps of the scale. The asteroid belt occupies exactly the angular position corresponding to the interval between F and F-sharp. This region is where the soprano makes the register shift, in C 256 tuning. Thus, complete coherence obtains, with this tuning, between the human voice, the solar system, the musical system, and the synthetic geometry of conical spiral action.

You readers might choke on an entire

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*The bill's proponents are clamoring to change something they don't understand.*

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lengthy paper made up of such gibberish, but our celebrity singers accepted it all without a murmur. If nothing else, they should have known that, contrary to the paper, not all sopranos and tenors register on or near F-sharp. (The paper states, “We take the soprano voice, for musical and developmental reasons, as the fundamental reference for the human voice in general,” making no provision for mezzos, baritones and basses in connection with “the laws of the universe.”) A cynic might say

that LaRouche doesn’t really give a damn about C 256 and the laws of the universe, since he’s willing to accept A 432. (When pressed, Percesepe had to acknowledge that a scale pegged to C 256 could not yield an A of 432. She asserted that whatever A it did yield would be “close enough.” I’m glad the laws of the universe are that accommodating! Incidentally, were C 256 adopted, no orchestra could long stay tuned to it, since rises of 4–5 cps are normal at any diapason.) A cynic might also say that LaRouche is spouting absurdity to disguise himself as a fool.

What of Verdi’s preoccupation with a universal diapason? His era performed little music written before 1830. When earlier works were revived, they

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### Cappuccilli Endorses LaRouche

In connection with his bid for the presidency, on November 5, 1988, on CBS, LaRouche aired a half-hour paid political announcement. Like another LaRouche half-hour commercial, it had only a modest amount of overt political content—apart from anti-communism and claims that the legal actions against him are politically motivated. The real purpose apparently was to offset unfavorable publicity by assuring us he is concerned with the general good. A variety of figures came forward to tell us he is brilliant and worthy.

LaRouche stated, “One of the high points of the many presentations at the [Milan] conference was Piero Cappuccilli’s demonstration of the difference between singing the classical repertory at A 440 and the proposed tuning: Giuseppe Verdi’s demand for A 432 [sic].” The commercial cut to a video of a portion of the conference with Tebaldi and Cappuccilli. He sang part of “O de’ verd’anni miei,” first to a piano tuned to A 432, then to one purportedly tuned to A 440 but, to judge from the video as well as from the tape Percesepe played on my show, apparently tuned to A 443.5. Next we were shown a video of Cappuccilli alone, who declared,

To describe Mr. LaRouche, I can only say that *he is a courageous man* who has done much for opera, particularly in his support for

Verdi’s standard tuning pitch, A 432, . . . With the current high tuning, voices find themselves in serious difficulties, and it’s very important to return to Verdi’s A. Verdi was right, and Mr. LaRouche, with his initiative, has also understood how important it is to go back to singing half-a-step lower. . . . *Mr. LaRouche has a broad-ranging mind extending into all fields of knowledge. LaRouche is a very eclectic person who is right on (molto in gamba). I wish there were more like him.*

The next video was of Amadeus Quartet violinist Norbert Brainin, who asserted that LaRouche “displayed the kind of analytical mind, the kind of truth seeking one associates with a real scientist.”

On my show, Percesepe claimed the campaign to lower the diapason was the Schiller institute’s, not LaRouche’s—as if there were a difference. However, at no time during the commercial was the institute mentioned; instead we were given to understand the conference was LaRouche’s brain child.

Alfredo Kraus’ position is different from Cappuccilli’s and Brainin’s. Speaking with me on “Opera Fanatic,” he stated he knew almost nothing about LaRouche and had no inkling of his politics. He had sent a letter endorsing lowering the A simply to help singers—unlike himself—who are uncomfortable at today’s tuning.

were interpreted in a Romantic manner. Verdi wasn't concerned with a Bach partita and *Otello* being performed at the same pitch but with *Otello* being performed at the same pitch in every theater. In any case, one diapason for all periods of music is inconsistent with authenticity of performance practice.

On grounds of authenticity, in this country, original-instrument performers of baroque music have rejected 440 and standardized one-half step down, at A=415. A diapason of 432 would be too high and brilliant for them. Fidelity to performance standards of Verdi's day dictates an A in the neighborhood of 450 (except, say, for French music). A multi-diapason universe would pose practical problems but maximize the impact of the music.

In the Introduction to the Bill, the two senators claim that A=440 is a tuning pitch to which "no orchestra in the world, or nearly none, adheres." On the contrary, as the senators' own tables of statistics confirm, never in history have more people tuned to the same diapason. Leaving aside the small number tuning to 415, in this country, Canada and England, virtually everyone tunes to 440. On the continent, some tune a little higher, others a little lower, but the differences typically are minor. There is no evidence to support contentions such as Cappuccilli's that "The current trend in the large orchestras is to put A up to 456 vibrations." LaRouche and company are trying to outlaw a consensus developed after hundreds of years of theorization, discussion and experimentation—a consensus that has endured since the beginning of the century.

Many singers have supported fascists. To name only two, Gigli was for Mussolini, and Roswaenge was an honorary member of the SS. The singers listed here are linked to LaRouche, who in his book *The Case of Walter Lippmann* called for a fascist-type government for the U.S. and Europe. LaRouche speaks differently to different audiences. On the one hand, he has denied being a fascist. On the other, he has stated, "It is not necessary to wear brown shirts to be a fascist. . . It is not necessary to wear a swastika to be a fascist. . . It is not necessary to call oneself a fascist to be fascist. It is simply necessary to be

one!" (See his July 7, 1978 speech, "Solving the Machiavellian Problem Today," published in his newspaper *New Solidarity* as well as in pamphlet form.)

Maybe the singers merely meant to express their preference for a lower A.

### Today's Standard Frequencies (at equal tempering)

C*	261.626	cps
C-sharp/D-flat	277.183	
D	293.665	
D-sharp/E-flat	311.127	
E	329.628	
F	349.228	
F-sharp/G-flat	369.994	
G	391.995	
G-sharp/A-flat	415.305	
A**	440.000	
A-sharp/B-flat	466.164	
B	493.883	
C	523.251	
C-sharp/D-flat	554.365	
D	587.330	
etc., etc.		

\*middle C, the 40th note from the bottom of the piano

\*\*the 49th note from the bottom of the piano

Maybe they'll tell us. LaRouche's organizations in Europe include the European Labor Party, active in a number of countries, particularly Italy. Presumably Mezzapesa and Boggio, the two senators, are familiar with his politics. Are they sympathizers? In any case, irrespective of authorship, the bill should be defeated.

A score of European newspapers, radio and TV programs have been reporting on the bill, parroting the Schiller Institute's claims—as did Bernard Holland in "Singers Join in a Lament about Rising Pitch," *The New York Times*, January 1, 1989: "Verdi, during his reluctant service as a lawmaker, actually legislated that in Italian opera houses the pitch A above middle C should be standardized as a sound vibrating at 432 cycles per second." (In the lengthy article, Holland avoided naming LaRouche and the Schiller Institute, probably to deny them publicity.) To date, Robert Rusk and I are the

only ones to speak out against the bill. (On August 25, 1988, Harvey Sachs, an American writer living in Italy, published a lengthy letter in *La Stampa* giving some background on LaRouche and asking whether the bill's supporters are aware of his politics.) In 1859 the French government fixed A at 435. Who knows what the Italian Senate might be capable of doing?

I don't want to make *Opera Fanatic* into an echo of *Opera News*. However, my article "Changing Your Tune" is the last word on the history of the diapason. So far, no one has disputed it. In view of the widespread confusion on the subject and the pending legislation, I am reprinting it here, courtesy of *Opera News*. (The article also appeared, in Italian translation, in the Fall, 1988 edition of *Professione Musica*.)

For background on LaRouche, contact an organization monitoring extremist groups called Political Research Associates, 678 Massachusetts Avenue, Suite 205, Cambridge, MA 02139. Or read Dennis King's book on LaRouche, to be published in early '89 by Doubleday. (Contacting the Anti-Defamation League proved a waste of time. Despite their wealth and attorneys, they claimed they were terrified LaRouche would cause their tax exemption to be revoked and refused to answer questions or supply minimal information.) I would be extremely grateful if readers would send me any clippings they may see on LaRouche and the diapason.

### Nonsense

"Today one cannot hear the real *Traviata* of Verdi as, for example, Renata Tebaldi sang this role in her time. Using the high tuning of A=440 or 445, it simply cannot be done."—Montserrat Caballe

"There is no orchestra, either in the big opera houses or in the provincial ones, which begins the performance at 440; they always start at 442, 443, 444 and keep going up every year. . . This 440 pitch . . . was already higher than the 432 used in Verdi's day. . . They have used this electronic pitch [put out by tone generators used for tuning] which in no way corresponds to A=440."—Renata Tebaldi (quoted from *Executive Intelligence Review*, April 22, 1988)

#### **Signatories of the Petition**

**Renata Tebaldi**  
**Piero Cappuccilli**  
**Mirella Freni**  
**Ruggero Raimondi**  
**Giuseppe Di Stefano**  
**Fiorenza Cossotto**  
**Maria Chiara**  
**Nicola Martinucci**  
**Marcella De Osma**  
**Gianandrea Gavazzeni**  
**Bruno Rigacci**  
**Bruce Brewer**  
**Ettore Campogalliani**  
**Lynne Strow-Piccolo**  
**Gilda Cruz-Romo**  
**Gianfranco Cecchelle**  
**Nazzareno Antinori**  
**Peter Schreier**  
**Christa Ludwig**  
**Birgit Nilsson**  
**Ann-Charlotte Bjoerling**  
**Bidu Sayao**  
and about 300 others

#### **Some New York-area signatories**

**Jascha Silberstein**  
**Nedda Casei**  
**Dianne Kesling**  
**Alberta Masiello**  
**Anthony Amato**  
**Ellen Repp**  
**Nico Castel**  
**Peter Volpe**  
**Paul de Leeuw**  
**Vashek Pazdera**  
**Jody Laski-Mihova**

#### **Question: What do these seven excerpts from the Introduction to the Bill have in common?**

We singers today have to deal with the highest tuning that has existed in the history of music. The "concert A" keeps going up.... Once, it was exceptional for the singer to be able to use his head voice, but today we are in a situation which no longer allows for us to use the chest voice.—Plácido Domingo, interviewed by *Die Welt*

When one feels the physical strain in the high notes or at the passage, then that means that the tuning-pitch is not natural. [If today we adopted Verdi's tuning of A=432] in five years, one could return to the old days.—Carlo Bergonzi interviewed in the LaRouche magazine *Il Machiavellico*

[A]s Bergonzi and Cappuccilli report, the aria "Ah si, ben mio, coll'essere".... is often transposed a half-step downward because it relies so much on the registral pas-

sage, and no tenor can execute this aria and "Di quella pira," with its final high C, without winding up in the hospital at the end of the performance, unless he goes back to the original key (half-a-tone lower).

[B]ecause of the too high tuning pitch, we no longer have dramatic voices, like that of Zinka Milanov. There are no more dramatic tenors, baritones, basses, or sopranos.—Bidu Sayao

[T]he race toward high tuning began at the initiative of the Russian and Austrian military bands and of Richard Wagner, who personally went to many wind-instrument builders to obtain higher instruments [sic], with the idea that the sound of the winds should prevail over the other instruments and the voices.

[T]he high tuning of today makes the correct interpretation of the entire repertory of the 1800s, written for a much lower tuning, impossible and causes serious damage not just to soloists' voices but also to the entire choral framework.—Gianandrea Gavazzeni

[The consequences of the rise in tuning pitch include] unstoppable acceleration of tempi owing to the sound being augmented by the raised pitch. It is natural to speed up the tempo in forte.

Answer: They are all false. (The statements are quoted from *Executive Intelligence Review*, August 12, 1988).

#### **The Bill**

##### **Article I**

The sound of reference for the basic tuning of musical instruments is the note A, whose pitch must correspond to the frequency of 432 hertz (Hz), measured at a room temperature of 20 degrees Centigrade.

##### **Article 2**

It is obligatory for institutes of musical instruction, for institutions and organizations in any way subsidized by the State or by public agencies, which run or use orchestras or other musical ensembles, and to the concessionary agency of public radio and television service, to consistently adopt as the reference sound for intonation, the note A.... Exemptions may be granted for exigencies of artistic research, except for passages of vocal music or opera performances.

#### **Article 3**

To comply with what is disposed by the foregoing articles it is obligatory to use practical reference instruments for intonation (tuning forks, metal rulers, plates, electronic generators, etc.) which are calibrated to the frequency of 432 hertz and endowed with the relevant mark of guarantee, indicating the prescribed frequency. A tolerance above or below this of 0.5 hertz is allowed.

#### **Article 4**

Contributions by the States and by public entities are also conditioned by the proven observances of the standards contained in the current law.

#### **Article 5**

The utilization of instruments of reference not conforming to the standard of the above Article 3 is punishable by the confiscation of the non-standard object and with a fine for each specimen of between 100,000 and 1,000,000 liras [approximately \$73-\$730].

#### **Article 6**

The specialized institutes authorized to supply the sample frequency for calibrating the reference instruments and to exercise control functions will be indicated by a decree of the Ministry of Public Instruction.

#### **Article 7**

The Ministry of Public Instruction, in concert with the Ministry of Tourism and Entertainment, shall take measures within the term of one year to issue the code of enactment of the current law.

#### **Article 8**

All preexisting laws on this matter are abrogated.

#### **Sutherland, Bonyngé and Pavarotti Sign Petition**

As we went to press, LaRouche spokesman Bill Jones alleged that Joan Sutherland, Richard Bonyngé, Luciano Pavarotti and Joseph Rouleau had each signed the petition.

# CHANGING YOUR TUNE

**Standards of Pitch Have Differed from Time to Time, Place to Place—and Were Not Always What the Experts Claim**

**Q**uestion: What do these six statements have in common?

The famous singers of a century ago [sic] sang anywhere from a half-tone to a whole-tone lower than now, standard pitch having risen that much since the bel canto golden age of Handel. All those thrilling high Cs of Cuzzoni, Bordoni, Grisi and Pasta were very likely Bs or even B-flats, which would raise hardly an eyebrow today from the vocalism fan. (Donal Henahan in *The New York Times Book Review*, March 18, 1973)

Pitch has been rising over the past hundred years . . . Today when I conduct *Moses und Aron* in Salzburg, I hear parts of it a whole half-tone above what my ear says it ought to be. (James Levine, quoted by Bernard Holland in *The New York Times*, January 1, 1989)

When *I Puritani* and *Lucia di Lammermoor* received their world premieres [in 1835], the pitch was about a whole tone lower. (Plácido Domingo, quoted in Steven E. Rubin, "Plácido Domingo/Sherrill Milnes: A Duolog on the Subject of High Notes," *Stereo Review*, February, 1973)

Don't forget, when the majority of these operas [from *Norma* through *Tosca*] were written, the C we know today was a B-flat. The pitch has risen a full tone in the past seventy years. (Rita Orlandi-Malaspina interviewed by Thomas P. Lanier, *Opera News*, December 15, 1979)

The music written by Mozart, Handel, Beethoven, Bellini and Rossini is now sung more than a semitone higher than it was actually written; *Lucia*, *I Puritani*, *Guglielmo Tell*, Rossini's *Otello* and *The Magic Flute* are all cases in point. . . Until [an A of 435 cycles per second] is achieved, the music of the last two centuries will never be heard as the composer heard it in his heart. (Mario Del Monaco, "When A Is Not A," *Opera News*, January 26, 1959)

Prevailing pitch, now internationally standardized at A=440 (oscillations per second), has risen, with many local variations and fluctuations, by about a semitone since the turn of the last century, and by a whole tone from that prevailing until then in southern Italy. (Henry Pleasants, *The Great Singers*, Simon and Schuster, 1981)

**ANSWER:** They are all false.

Standards for musical pitch, often called "diapasons," are typically expressed with relation to A in the middle of the treble staff. For the pitch to have been a half-step lower, relative to the modern theoretical standard of A=440 cycles (vibrations) per second, at even tempering the A would have equaled 415.305 cps. For the pitch to have been a whole-step down, the A would have had to have been at 391.995 cps (the pitch of today's G). For the period from Handel to today, not only was the A not typically as low as a half-step down from A=440 cps, but for much of the 19th century the diapasons generally in use were actually *higher* than ours.

As late as the baroque period, the concept of a precise and universal relation between notation and pitch, such that each note designates a particular frequency, was generally unknown in the West, though not in China, the Solomon Islands and Brazil. Tuning forks did not come into existence until the early 18th century, but on the basis of surviving organs and the measurements of the early 17th-century German composer Michael Praetorius, researchers have been able to determine approximately what some diapasons were as far back as the beginning of the 16th century. One organ in 1511 was tuned to an A of about 510 cps, not far from a

minor-third above our current standard (modern C is at 523.251, modern B at 493.883). The A of an organ playing in 1611 was about 360, a minor-third lower than today's (modern F-sharp is 369.994). Organs with As in the upper 300s, along with those in the upper 400s, abounded and coexisted incompatibly for several hundred years.

For instruments to be able to play together in tune, they must be tuned to essentially the same diapason. As a result, by 1600 each musical center had developed collections of instruments tuned to not more than two or three competing diapasons. These typically included a pitch for sacred music (at certain frequencies called "Chor-Thon" by Praetorius), the diapason of a local organ, and a pitch for chamber music (at certain frequencies called "Cammer-Thon" by him), the diapason in use at the castle of the local prince. Praetorius found in 1619 that the E strings of violins, then made of gut, could not long withstand being tuned to an A of 455 cycles. Yet in the 17th century, that important operatic center Venice and several other Italian cities appear to have persevered with this standard. (In the late 19th century, after stronger strings and suitably built fiddles had come into use, this became the diapason for orchestras in New York, London and Vienna.) In 1698 orchestra pitch in France was generally about 430. Lully's operas, however, were given at a diapason of about A=410.

In 1740 Handel made use of a tuning fork with A at 422.5. In Berlin in 1752, 421.9 was the standard. Mozart's piano around 1780 was tuned to a fork of A=421.6. The diapasons used for the first performances of Handel's and Mozart's operas have not been recorded; on the basis of evidence that includes surviving tuning forks, students of the subject believe they were in the neighborhood of 422–425 cps, about three-fifths of a semitone below today's standard.

Enlargement of the orchestra and the development of orchestral instruments in the 19th century spawned higher and higher As. Many of the instruments were thought to sound better at the higher diapasons, and the more brilliant orchestral sound was felt to be

more exciting. The pitch at the Paris Opera, A=423 in 1810, by 1822 had risen to 431.7, when the singers succeeded in having it reduced to 425.8, where it stayed for five years. But in 1830 it was back to 430.8 and continued to rise. In 1855 it was at 449, in 1858 at 448 at both the Opera and the Théâtre-Italien.

At the Dresden Opera House, a tuning fork in use from 1815 to 1821, in Weber's time, shows that the pitch there was at 423.2. The fork used in 1826 sounds A at 435. The rise continued: in 1858, A was at 441. A voice teacher called Naeke, disapproving of the trend, turned up at the house in 1861 armed with a tonometer and went on to claim that during the performance an A of 446 was being attained. He was disbelieved, but as a result of his efforts, performances of *Die Zauberfloete*, *Idomeo* and Marschner's *Der Templer und die Juedin* were mounted with a set of instruments from the period when the works had been written, tuned to an A of 424. A conference report on October 1, 1862 concluded that in general a lowering of the pitch standard to A=435 would be welcome but that a return to the diapason of Mozart's day under 1862 conditions would injure the brilliance and effect of the music for listeners accustomed to higher pitch. Naeke filed a dissenting report, insisting the conferees wrongfully ignored the vocal health of singers.

The pitch of the Philharmonic Society in London in 1813 was A=424. The mean Philharmonic pitch there in the period 1846–54 was A=453. In 1834 a Stuttgart congress of physicists, finding that the mean pitch of Viennese pianofortes was A=440, accordingly recommended that this be adopted as the standard diapason—*plus ça change . . .* 436.7 was the diapason in Florence in 1845, 439.9 the one at Turin that same year, where by 1858 it had gone up to 444.7. At La Scala A=446.6 was in use in 1845, but in 1856 the pitch was 450.3 according to one source, in excess of 451, according to another. In 1858 A equaled 435 in Karlsruhe—an anomaly, for in that same year it was 445 in Naples, 447 in Marseilles, 447.1 in Munich, 447.7 in Leipzig, 449.7 in Prague, 451.5 in Berlin and St. Petersburg, 455 in Brussels. 456 was the dia-

pason in Vienna in 1859, and 457 was what Steinway and Sons built its pianos to in New York in 1879. In 1858 Broadwood's in London had three forks with different diapasons. One was for tuning pianos used to accompany at vocal concerts; its A was at 435. The second was for pianos used to play in instrumental ensembles; its A was at 452.5. The third embodied the pitch used 1874–95 by the Philharmonic Society and a number of other orchestras as well as piano makers; its A was 455.5, about three-fifths of a whole-tone higher than in 1813 and about three-fifths of a semitone higher than the modern standard (today's A-sharp being 466.164).

In 1858 the French government set up a commission to establish a *diapason normal*. This body consisted of six composers—Rossini, Auber, Berlioz, Fromental Halevy, Meyerbeer, Ambroise Thomas—plus two physicists and four government officials. On February 1, 1859, the commission recommended “in the name of the Emperor” that A be fixed at 435. Verdi, said in the Ricordi *Gazzetta* to have approved this decision, wrote to Ricordi in 1863, “On the contrary, last year I told Rossini that a standard diapason was useful and desirable, but that the commission had been wrong in lowering it too much. By way of complete reply, Rossini told me he could not discuss the matter, because he had never attended a sitting of the commission. And he was its president!” (Rossini had regarded the appointment as purely honorary.) Since decrees “in the name of the Emperor” were the law of the land in France, A=435 was adopted there, though because of technical difficulties in manufacturing, the official forks distributed averaged 435.5 cps. Under the law, many existing diapasons now had to be lowered about four-fifths of a semitone. The new pitch won only partial acceptance in Germany and Italy.

The Society of Arts, a British organization, in June, 1859 inclined to the view that the French commission had set the A too low. As a result of theoretical and technical muddles, the society made recommendations of its own, resulting in a diapason that may have been higher than intended, 449.5. By 1879 the A at Covent Garden had

reached 450 according to one source, 455 according to another, at which point Adelina Patti forced the management to make the orchestra tune to the “French pitch” of 435. A. J. Ellis, foremost British authority on the subject, snorted to the society during his 1880 lecture, “As if the price of whole orchestras of instruments bore an appreciable ratio to the loss caused by the premature ruin of one great singer's voice!”

At the invitation of the Austrian government, an international conference on pitch was convened in Vienna in 1885. It found in favor of *diapason normal* but with a further refinement: because the rate of vibration of a tuning fork falls minutely as the temperature rises, to insure conformity to the standard the commission specified that “To represent this Pitch Note a normal tuning-fork shall be constructed so as to give the normal note at a temperature of 15° C [59° Fahrenheit].” The commission also issued a directive to instrument makers about test procedures so that their products would be suitably tuned, and it endorsed the use by orchestras of “a tuning-fork kept in motion by electricity.”

The British, however, were not represented at the conference. In 1895–96 their Philharmonic Society adopted a pitch standard of A=439, B-flat=465, C=522 at 68° Fahrenheit, “at which degree of heat, orchestra, organ and pianoforte should be in tune together.” They thought of this standard as “derived” from *diapason normal*, which, however, they inadequately understood: because of a faulty translation of the French law, they thought of it as temperature-contingent, whereas it is an “absolute” standard, unrelated to heat. The figure of 68° was specified because it had been found to be the average temperature of concert halls then. (The new standard did not address what the pitch should be, for example, in churches and cathedrals, which typically are colder.) In any event, when the Lamoureux Orchestra from Paris joined forces with the Queen's Hall Orchestra in London in 1899, to everyone's relief they each sounded an A of 439. That same year, however, Covent Garden was using 440 at 70° Fahrenheit. In 1895 financial backing for what became the Henry Wood Prom-

nade Concerts at the new Queen's Hall was forthcoming from one Dr. Cathcart, a throat specialist, on condition that pitch be reduced to *diapason normal*. The stipulation was accepted, and the pitch lowering was quickly imitated elsewhere in London. In 1899 the Pianoforte Trade Agreement specified the adoption of *diapason normal*, and piano firms on both sides of the Atlantic complied.

Early in our century, instrument manufacturers in the U.S. began to build to the standard of A=440. This development was hastened by the advent of electric tone generators that could readily produce this frequency with great accuracy; 439, for example, a prime number, cannot be produced as easily electrically. In 1939 a conference on pitch was organized by the British Standards Institution and held in London under the auspices of the International Standards Association. Some of the conferees maintained that analyses of recordings, as well as of radio broadcasts over the preceding eighteen months, showed a lack of a standard diapason: orchestras were tuning to the notoriously unreliable As of oboes rather than to tone generators, and as a result many were tuning sharp. The use of the oboe for this purpose was condemned. The conference promulgated British Standard Pitch, A=440. With the advent of electric tone generators, it had become unnecessary to specify a standard fork and standard temperature for reference. Under the new standard, variations of pitch of instruments as a consequence of temperature were regarded as defects, to be faced by manufacturers and players. Despite these efforts, from 1941 to 1950 La Scala tuned to an A of 448. The International Organization for Standardization endorsed A=440 at a similar conference in 1955 and reaffirmed it in 1975. Experts in the field still deplore the insufficient use of tone generators for tuning.

Standards for tuning are by no means the only factors that cause fluctuations in orchestral tuning. Some change of pitch may be occasioned by temperature changes within a concert hall or opera house. Pitch rise may be caused as well by the warming of instruments during performance. Moreover, mea-

surements taken after the 1939 conference show that orchestral rises of a few cps typically occur in passages marked by musical tension.

With all these difficulties, how have instrumentalists managed to play together acceptably over the years? Most woodwind and brass instruments can be made to vary the pitch of the A by four or five cps or more, through changes made with the lips or the pressure of the breath or the length of the instrument. Strings in this respect are of course even more flexible.

The A of today, 440—though this was not the reason for its adoption—lies midway between the As of Mozart's time and the highest As of the 19th century. The Queen of the Night's Fs were lower in Mozart's time than ours, Manrico's Cs were higher in the 19th century than today, the difference between then and now being a quarter-step, more or less, in each case. But Arturo's

F in *I puritani* would have been at about the pitch it is currently.

Because of the vocal techniques in use today, few singers manage the high notes of early 19th-century Italian opera comfortably. Most would be thankful if the A were lowered. In any case, because of investments in organs and other instruments, the A of 440 seems likely to stay with us. However, in this country performers of baroque music on original instruments have standardized a half-step lower, at A=415. For the sake of fidelity to the practices of Verdi's day, performers of *Trovatore* may conceivably come to tune to an A of, say, 450.

*This article has been reprinted, with minor changes and additions, from the January 3, 1987 issue of Opera News, courtesy of that magazine. The article also appeared, in Italian translation, in the Fall, 1988 issue of Professione Musica.*

## PITCH PUTSCH LaRouche's Efforts to Change the Tuning Pitch Rest on Confusion

by Robert Rusk

### C=256 is Not A=432

One excellent reason why the Schiller Institute petition, quoted elsewhere in this issue, should not be used as a basis for legislation is that it conspicuously fails to set a single unambiguous standard for tuning. The petition recommends two values, C=256 and A=432, citing them interchangeably as if they were equivalent; in fact, in our current equal-tempered system, the two are incompatible. Their non-equivalence would be obvious to the ear if two skilled piano tuners were engaged to tune two different pianos in the same room, with one, let us call him Mr. Caro, given a C 256 tuning fork to use as a standard and the other, a Mr. Amato, employing an A 432 fork. Mr. Caro would tune the notes of the C-

major diatonic scale to the frequencies on the left in figure 1, Mr. Amato would tune to the frequencies on the right:

Caro	Amato
<b>256</b>	= C = <b>256.8687</b>
287.350	= D = 288.325
322.430	= E = 323.634
341.719	= F = 342.879
383.567	= G = 384.868
<b>430.539</b>	= A = <b>432</b>
483.256	= B = 484.904
<b>512</b>	= C = <b>513.737</b>

figure 1

Combined in duet, the two instruments would sound slightly but annoyingly out of tune with each other. The ear

*Verdi would counsel Italy not to cause chaos by breaking with 440.*

would confirm what the chart shows: that choosing Mr. Caro's C as a standard entails rejecting Mr. Amato's A (and vice versa), because, in equal-tempered tuning, C=256 is equivalent to A=430.539, while A=432 is equivalent to C=256.869. (See Appendix for proof.)

Equal Tempered (Normal) Major Sixth	LaRouche (Oversized) Major Sixth
A430.539 <hr/> C256	A432 <hr/> C256
Equal Tempered (Normal) Minor Third	LaRouche (Undersized) Minor Third
C512 <hr/> A430.539	C512 <hr/> A432

figure 2

To be sure, it is mathematically feasible to construct a kind of "scale" with equal half-steps between a C of 256 and an A of 432, but because this A/C major sixth is too big (see fig. 2), the octave would also be enlarged—to a weirdly

$$\text{out of tune } \frac{C514.318}{C256} \left( \frac{A432}{A215.026} \right).$$

Even worse would be a hypothetical "scale" built around an A of 432 and a C of 512, the undersized minor third entailing a grotesquely shrunken octave of  $\frac{C512}{C259.493} \left( \frac{A852.371}{A432} \right)$ . (Opera lovers of exceptional cruelty may refer to the first values as the "Rysanek octave" and the second as the "Caniglia octave.")

No such "scales," of course, are suggested in the LaRouche materials: there the harmonious natural proportion of the 2/1 in-tune octave ratio is taken as a given, entailing a C of 256/512 or an A of 216/432/864. The Schiller Institute would be philosophically and (one hopes) aurally outraged at these enlarged and shrunken octaves, stemming, though they do, from a desperate attempt to find some way—any way—of putting the LaRouche C/A and A/C ratios into practice.

How could the Schillerites have

October 6, 1988—In the eighth race at Belmont Track, Angel Cordero, Jr. rode a horse named Diapason. No doubt upset by the proposed legislation, the horse started poorly and finished last.  
—Andrew Gurian

made so elementary an error? The answer is that they relied on a theoretical untempered diatonic major scale in a system known as "just intonation," a scale that is convenient for acoustical calculations but virtually unusable for music. Just intonation uses some of the "pure" frequency ratios that Pythagoras and later theorists recommended for certain intervals (minor third = 6/5; major third = 5/4; perfect fourth = 4/3; perfect fifth = 3/2; major sixth = 5/3, etc.). In equal temperament, these fractions are all slightly modified to prevent the sort of enlarged and shrunken octaves produced above by the LaRouche values. In just intonation, by contrast, the octave is preserved by the curious method of using intervals that are not uniform in size: some are "pure," some exceedingly "impure." Thus "bad" thirds appear along with "good" thirds, "bad" fourths along with "good" fourths, etc., making certain commonly used chords intolerable to the ear. Despite its peculiar sounds, the just-intonation scale is valuable for calculations, thanks to tidy arithmetical relations which are best appreciated when its frequencies are shown in A major at modern pitch (fig. 3).

<b>A = 440</b>	<b>259.2 = C = 256</b>
B = 495	291.6 = D = 288
<b>C# = 550</b>	324 = E = 320
D = 586 $\frac{2}{3}$	345.6 = F = 341 $\frac{1}{3}$
<b>E = 660</b>	388.8 = G = 384
F# = 733 $\frac{1}{3}$	<b>432 = A = 426 <math>\frac{2}{3}</math></b>
G# = 825	486 = B = 480
<b>A = 880</b>	<b>518.4 = C = 512</b>
<b>B = 990</b>	

figure 3

figure 4

Note the numerical pattern formed by A-C#-E-A and the bottom B. Acousticians usually prefer to give the just inton-

nation scale in C major, in which C/A is a "good" third, with a 6/5 ratio, C512 being equivalent to A426-2/3, and A432 to C259.2 (see fig. 4).

However, a G-major just-intonation scale based on a G of 192 cps (fig. 5) does indeed contain the pitches A = 216/432 and C = 256/512: for here, C/A is the "bad" minor third  $\left( \frac{C512}{A432} = 1.185185 \right)$ , the "good" minor thirds being  $\frac{D288}{B240} = \frac{G384}{E320} = 6/5 = 1.2$ .

<b>G = 192</b> [24]
<b>A = 216</b> [27]
<b>B = 240</b> [30]
<b>C = 256</b> [32]
<b>D = 288</b> [36]
<b>E = 320</b> [40]
<b>F# = 360</b> [45]
<b>G = 384</b> [48]
<b>A = 432</b> [54]
<b>C = 512</b>

figure 5

This scale has been singled out for study by some theorists, including the 1881 Milanese committee members who recommended A=432 to the Italian Ministry of War, because it has a fascinating arithmetical property: as the numbers in brackets show, its frequencies consist entirely of whole-number values (no fractions), until one gets below the bottom note of the piano (G = 24 cps, but the low F-sharp, not on the chart, is 22.5 cps). Because of its numerical elegance this scale was called "scientific." But all that designation means is that the scale is arithmetically convenient for scientists' calculations. It has no real scientific relevance to music played in equal temperament at a diapason of A=432.

For the record, it should be said that singers, string-players and wind-players do not adhere at every second to strict equal temperament but continually sharpen and flatten intervals to bring them closer to "good" just-intonation ratios. Thus the listener hears fleeting moments of just intonation superimposed on a pervasive background of equal temperament. What one does not hear, if the performer can help it, is any "bad" ratios like the LaRouche C/A, so this "bending" of intervals is irrelevant to the Schiller Insti-

tute's case. Note also that a few 20th-century composers, such as La Monte Young, have attempted to write music in just intonation, taking into account the peculiarities of the scale and avoiding "bad" intervals; however, as we shall see below, the Schiller Institute is hostile to experimental modernism.

The correspondence between C=256 and A=430.539 leaves the Schiller Institute in the position of a house divided—a richly ironic situation, if its members had only the wit to comprehend it. Jonathan Tennenbaum, for whom C=256 reflects Kepler's "harmony of the world," should be screaming bloody murder at the prospect of A=432, a pitch that ensures that every piece in C major or C minor will be played at C=256.87. (See "The Kepler connection," below.) Indeed, the bill his Institute favors, as currently drafted, directs that in state-supported Italian musical institutions, *all tuning implements that vary from A432 by more than 0.5 cps* (including, we must assume, C256 tuning forks) *shall be confiscated and their users assessed a fine of between \$75 and \$750*. Can the wording of the legislation be the first step in a Byzantine LaRouche plot to purge Tennenbaum? Is the petition instead an exercise in Orwellian logic (the party says two plus two equals five)? Or would it more fairly be described as the result of mathematical ignorance?

### Verdi's advocacy

As Stefan Zucker maintains elsewhere herein, a historical case can scarcely be made for A = 432. The chief argument in its favor stems from the fact that Verdi once endorsed it.

When the Italian Ministry of War set out to fix a standard pitch for military bands in 1881, it found itself confronted with two widely diverging Italian proposals for the diapason: one from the Accademia di Santa Cecilia in Rome (A = 450) and one from a musical congress in Milan (A = 432). Choosing the lower A, the ministry assembled a committee of Milanese military and civilian bandmasters, chaired by an army major, and saddled this group with the burden of explaining to the public why the Rome pitch was undesirable. These Milanese

"experts," to bolster their credibility, solicited endorsements of their A = 432 diapason from several distinguished Italian composers and conductors, Verdi among them.

The cautiously worded testimonial Verdi provided (see "Weird Bedfellows") craves careful exegesis. He made the following points: He was already on record for the *uniform* use of 435 in Italy and France. If 435 was mathematically objectionable, he was prepared to accept 432, since, to the ear, 432 was *essentially uniform* with 435. The Roman 450 was too high. A *uniform* standard was desirable worldwide. Music is a *universal* language. *Diversity* of pitches between different cities made no sense.

In this short letter, as the emphases show, Verdi managed to laud uniform-

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*Were the bill enacted into law, Tennenbaum's C=256 tuning fork would have to be confiscated!*

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ity (or universality) no less than *four times* and to decry diversity once. Obviously he meant to indicate in the strongest possible terms that the overwhelming priority was the choice of *some* uniform international standard. What he did *not* say is equally significant. While professing himself amenable to a small change from the 435 he had previously endorsed, Verdi *carefully avoided recommending any such change on his own authority*. He chose to mention 432 *only once*, saying merely that it had the merit of sounding almost like 435—a negative virtue at best. Of positive qualities that might have made 432 a desirable diapason, *Verdi cited not a single one*. No unprejudiced reader could call this passionate advocacy.

True, Verdi deferred to mathematical exigencies. Was he aware that "scientific" pitches are not performance pitches? Unfortunately, we do not know. We do know, however, that Verdi soon changed his mind about the diapason, endorsing the A 435 recommended by the Vienna conference of 1885. Ultimately, Verdi's support for the Milanese pitch lasted less than two years.

Today, in A = 440, we have exactly

what Verdi recommended: a worldwide standard pitch very close to A = 435. Changing now to a mandated 432 in Italy would lead to the very situation he denounced—the use of different pitches in different cities and countries. Given the priorities enunciated in his letter, Verdi would unquestionably be dismayed that anyone would think of using his decidedly tepid and short-lived endorsement of 432 as a tool to rupture the international uniformity we enjoy today—a uniformity he espoused so urgently.

As Stefan Zucker has observed on WKCR, two serious questions about Verdi's attitude toward the diapason persist: Why, in 1884, did he recommend the A = 435 that he had rejected as "too low" in 1863? And, why, in 1884, did he reject A = 450, even though in the 1850s his operas were premiered at pitches in the neighborhood of A = 450? Perhaps the answer is that, while a composer can compensate for an excessively low fixed diapason by writing higher, he has no way of dealing with an unpredictably fluctuating diapason. Still, the matter remains somewhat mysterious.

### LaRouche's advocacy

Does A=432, a pitch too low for the music of the past 150 years, have a place in LaRouche's overtly political agenda?

Far from applauding all the political and cultural developments of the past century and a half, LaRouche apparently sees himself as a lone sane voice from the bunker, attempting, with sweet reason that falls on deaf ears, to dissuade the heedless multitude from plunging the world into a Spenglerian cultural holocaust. LaRouche sees signs of the decline everywhere, not least in our music.

A few years ago, one of LaRouche's organs published an article purporting to prove scientifically that all modernistic contemporary music was acoustically invalid, harmonically fraudulent and therefore esthetically deleterious to Western culture. The authority invoked to support his claim was none other than the brilliant if idiosyncratic analyst Heinrich Schenker.

Schenker developed an invaluable

method of harmonically viewing music on the "foreground," "middle-ground" and "background" levels, enabling the analyst to see individual harmonic details against the background of the overall plan—to study individual trees, as it were, while maintaining a sense of the ecological totality of the forest. Unfortunately his analytical techniques grew too rigid to deal with the harmonic innovations of Liszt, Wagner and their followers—these he myopically dismissed as degenerate.

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*A 432 in Italy today would create the situation Verdi deplored—different pitches in different cities.*

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Most of Schenker's followers have found fruitful methods of applying Schenker analysis to Wagner scores and more radical 20th-century works. The LaRouchites, on the other hand, invoke Schenker to "prove" that society cannot be put back on the "scientific" road to cultural health, unless the music of Strauss, Schoenberg, Stravinsky, Prokofiev, Copland, Bartok, Boulez, Britten, Wuorinen, Rouse, et. al. is ignominiously expelled from our concert halls. LaRouche, in fact, exhibits a musical taste almost identical with that of Hitler and Stalin.

Anti-modernist readers tempted to applaud a purge of the avant-garde should bear in mind that no strict Schenkerite, even wearing rubber gloves and a surgical mask, would touch *Cavalleria rusticana* with a five-foot-long pair of anti-septically hot tongs—not to mention *Tosca*, *Boheme* and the vast repertory of verismo slumgullion that still appeals to many opera aficionados. Those looking for allies against *Moses und Aron* and *Oedipus Rex* should beware of throwing out the baby with the bath.

In their dealings with music, the LaRouchites have shown an eerie gift for spurning the gold while flaunting the dross as a priceless discovery: from the scholastic potency of just intonation, the structural clairvoyance of Schenker and the supernal astrophysics Kepler, they take nothing but a "bad" minor third, an anti-modernist blind spot and an aberrational plunge into

queer musico-planetary mysticism.

What has all this got to do with a 432 diapason? Well, the sneaking suspicion arises that the unsuitability of this low pitch to modern music causes LaRouche no grief—that he would not be displeased if the muddled textures caused by too low an A severely vitiated the audience appeal of pieces like Stravinsky's *Le Sacre du Printemps*, Copland's *Billy the Kid*, Britten's *Curlew River* and Berg's *Wozzeck*. That these and hundreds of other portraits of 20th-century culture would be ill-served by a 432 A, LaRouche would doubtless regard as serendipitous.

### Appendix The Kepler connection

Even if we accept Tennenbaum's premise that the earth's daily rotation produces a "pitch" of low G, simple calculations show that this "planetary diapason" does *not* correspond to a C of 256! Tennenbaum sets earth-pitch equal to one cycle per day, which, restated in cycles per second is 1/86,400. To raise this pitch by 25 octaves, multiply it by  $2^{25}$ , or 33,554,432.

We find that  $\frac{33,554,432}{86,400}$  equals 388.36.

This frequency, very close to our modern G, does not correspond to a C of 256 in any scale. In equal temperament, it is equivalent to an A of 435.92 and a middle C of 259.2.

### General directions for computing comparative equal-tempered pitches

- to raise the pitch by an octave, multiply its frequency by 2.
- to raise the pitch by half an octave (an augmented fourth), multiply its frequency by the square root of 2 ( $\sqrt[2]{2} = 1.414213$ ). Starting on middle C, two such multiplications will produce the pitches (C) F# and C.
- to raise the pitch by a third of an octave (a major third), multiply its frequency by the cube root

(i.e., the third root) of 2 ( $\sqrt[3]{2} = 1.259921$ ). Three such multiplications will produce the pitches (C) E G# and C.

- to raise the pitch by a fourth of an octave (a minor third), multiply its frequency by the fourth root of 2 ( $\sqrt[4]{2} = 1.189207$ ). Four such multiplications will produce the pitches (C) E<sup>b</sup> F# A and C.

- to raise the pitch by a sixth of an octave (a whole step), multiply its frequency by the sixth root of 2 ( $\sqrt[6]{2} = 1.122462048$ ). Six such multiplications will produce the pitches (C) D E F# G# B<sup>b</sup> and C.

- to raise the pitch by a 12th of an octave (a half-step), multiply its frequency by the 12th root of 2 ( $\sqrt[12]{2} = 1.059463094$ ). Twelve such multiplications will produce the pitches (C) C# D D# E F F# G A<sup>b</sup> A B<sup>b</sup> B and C. (Remember that in equal temperament, C#=D<sup>b</sup>, D#=E<sup>b</sup>, F#=G<sup>b</sup>, G#=A<sup>b</sup>, A#=B<sup>b</sup>.)

Using the decimals provided, one can calculate the A that is equivalent to middle C=256 in any number of ways, for example: rising from C by nine half-steps; rising from C by two major thirds and a half-step; rising from C by four minor thirds; rising from C by four whole steps and a half-step; rising from C by one augmented fourth and one minor third; etc.

All calculations will indicate (with an error amounting to perhaps .0002) that A=430.53896.

Similarly, one can calculate the middle C equivalent to an A of 432 by several methods, the most convenient of which involve dividing by the decimal (instead of multiplying), to lower the pitch. For example: descending from A by nine half-steps; descending from A by three minor thirds; descending from A by two major thirds and a half-step; etc.

Again, all calculations will indicate that C=256.8687. The decimal values for the given intervals apply for any diapason.