

# In Search of the Secrets of Medieval Organs: The European Summer of 2012

## A Report and Some Reflections

By David Rumsey



Basel Peterskirche concert June 9, 2012: (l to r) Marc Lewon (lute), Eva Kopli (soprano), Brett Leighton (organ), Nicolas Savoy (tenor), Elizabeth Rumsey (vielle); obscured: Dominik Hennig, (calcant) (photo: Gabriele Lewon)



Basel workshop: (l to r) Crawford Young (lute), Tobie Miller (hurdy-gurdy), Brett Leighton (organ), Elizabeth Rumsey (vielle) (photo: Bernhard Witzke)

On Friday and Saturday, June 9 and 10, 2012, a concert and workshop focusing on the medieval organ were held at the **Basel** (Switzerland) Peterskirche. They dealt with concepts, designs, repertoire and the medieval organ used in ensemble.<sup>1</sup> Another symposium and series of concerts was later organized in and around East Friesland (**Rhede**), commencing Monday, September 3, 2012, running until Sunday, September 9, dealing with much the same topics.<sup>2</sup> Some instruments and participants were common to both events. Elsewhere Kimberly Marshall played and held courses in **Sion** (Switzerland) during October 2012. Other events in Europe during the summer of 2012 dedicated to the medieval organ included one arranged by Jos van der Giessen in the **Netherlands**.

Kimberly Marshall's 1989 book, *Iconographical Evidence for the Late-Medieval Organ in French, Flemish and English Manuscripts*,<sup>3</sup> was of seminal influence to much of this blossoming culture. It was the most oft-quoted work at the Basel and Rhede conferences. A colloquium in 1995 at Royaumont (France), two years after an 11th-century *Theophilus* organ had been reconstructed there by Antoine Massoni, was a most important sequel.<sup>4</sup> Marcel Pérès, responsible for the Royaumont *Theophilus* organ, also played in Basel during August 2011. The 2012 events were significant vantage points in an ongoing search for the Holy Grail of understanding medieval organs and performance practices. They continued to push back through the 15th, 14th, 13th centuries, even to the 3rd in Rhede.

### The Phenomenon

The observant phenomenologist might well note something in the air: research into and performance of early

music has now spread both forwards and backwards in time—from a “Bach-fulcrum” that began with Mendelssohn, S.S. Wesley, et al. in the early 19th century. By the late 20th century it had reached fortepiano, early Steinway, the “real” Wagner orchestra, and even Stravinsky's *Le Sacre du printemps*, where authenticity of instruments used was a measure of performance excellence. Concurrently, moving back to ever earlier eras, the music of Buxtehude, Frescobaldi, Couperin, Correa de Arauxo, and Sweelinck—among many others—has been vigorously regenerated through performance on historic organs, careful emulation of their temperaments, key proportions, wind quality, specifications, tonal and mechanical attributes, all of which illuminate performance practices.

Other 19th- and 20th-century contributions to this historical consciousness included the continuum of English choral music, the rediscovery of Palestrina, and parallel developments in Gregorian chant. In the educational arena it seeped into musical institutions such as Eugène Gigout's 19th-century Organ School in Paris or the early 20th-century Schola Cantorum Basiliensis, not to forget the work of Solesmes and similar centers. High-profile specialist performers such as Gustav Leonhardt then came on the scene, increasingly promoting serious research, publications, recordings, and concerts. Discrete organ cultures began to be brought back to life by dedicated builders, researchers, performers, and luminaries. A veritable explosion of knowledge and activity erupted around the turn of the 21st century.

The phenomenon is now neither confined to the organ nor the 16th–19th centuries, but takes in viola da gamba, cornetto, medieval fiddle, lute, harpsichord,

hurdy-gurdy, harp, bells, whole families of antique instruments, and virtually all music of any period. The ongoing challenge in the medieval arena for instrumentalists is that of surviving originals. Certainly extant and truly original 16th-century organs are scarce. Precious little material dating from before the 15th century is known—and then essentially only fragments. Iconography, contemporary descriptions, the few comprehensible early organbuilding tracts, and much circumstantial evidence taken from extant contemporary repertoire are about all that there is to go on. At the Rhede conference, Winold van der Putten, who was responsible for building many of the instruments present, added another significant factor: the experience of specialist organbuilders who have now regularly interpreted these old sources and learned how to put theories or confusing historic descriptions into practice. This is a cutting edge where artistic fringe-dwellers live dangerously by constantly expanding boundaries. It is a little like “walking the plank,” just that the board gets narrower as it seemingly extends back forever, engaging the enquirer in an ever more precarious balancing act. But the rewards are tangible, and in the past few years fully successful medieval constant-scaled ranks have been constructed and voiced. They were commonplace enough for much of medieval instrument-building history and essential to its performance.

Walter Chinaglia, from Como (Italy)<sup>5</sup> was another of those present in both Basel and Rhede with several of his own positives and portatives built from extending what is “seen through a glass darkly” into convincing practical realities, another fruit from the experiences of these increasingly skilled specialist builders. There are others—Marcus

Stahl of Dresden<sup>6</sup> and Stefan Keppler of Kötz,<sup>7</sup> to name but two from Germany.

### 2012—European Medieval Organ Summer

On Saturday afternoon, September 8, 2012, the **Rhede symposium** was nearing its conclusion and running rather late, since so many people had had so much to offer. The interest was exceptionally keen; most sessions had extended well beyond their scheduled times. About 15 different organs had been assembled in a kind of “grand general meeting of gothic organs.” They emulated everything from a hydraulis to 13th, 14th, and 15th-century portatives and positives. There were also some renaissance instruments, including an original 16th-century Italian organ, the most modern of the assembly, a permanent fixture in the Old Church at Rhede, nodal point of this symposium. Other venues around this East-Friesland region included Weener and Rysum. Attendees came from Germany, Netherlands, Scotland, Switzerland, Australia, Czech Republic, USA, and Scandinavia.

At the outset Harald Vogel made the poignant observation that this unusual gathering of medieval organs was an exceptionally important event in the history of the instrument, a hitherto virtually unthinkable assembly. It was organized by the Weener *Organeum*, Winfried Dahlke in charge, supported by a squadron of organists, organbuilders, and others whose burning curiosity clearly motivated them strongly.

Dr. Vogel inaugurated the “Rims” instrument, made for a German organist by Orgelmakerij van der Putten after mid-14th-century practices: constant-scaling, two 8's in parallel (effectively 8' II-ranks, always playing, no stop control) and a 6' (on a separate register, slider



Walter Chinaglia demonstrates one of his portatives; two more are in the background (photo: Jos van der Giessen)



The Rims organ with its "Praetorius" keys (photo: Winold van der Putten)



Walter Chinaglia demonstrates his positive organ emulating van der Goes (photo: Jos van der Giessen)



A new reconstruction of the Aquincum organ (photo: Winold van der Putten)

above the windchest). The resemblance to an organ described in the 10–12th-century *Sélestat Manuscript* gives its 8' + 8' + 6' specification full credibility.<sup>8</sup>

The prototypical culture that inspired the Rims instrument used lead as pipe material, constant scaling after the 11th-century Berne Anonymous MS,<sup>9</sup> and keys as described by Praetorius for Halberstadt.<sup>10</sup> Its Gamba-Quintadena-like bass tones with Principally-Flutey trebles were an experience all of their own. They came into good use during the symposium in Gregorian alternatims, borduns supporting chanters, and works such as medieval *Redeuntēs* with long-held bass notes under more agile trebles. This instrument presented a left-hand cantus firmus of an early *Felix namque*<sup>11</sup> with remarkable ease and complete conviction; its scaling allowing the "slow-note cantus firmus" to stand out against right-hand elaborations as if two manuals were being used. Yet no normal two-manual organ could ever achieve the effect so convincingly. An understanding of the 13th-century Notre Dame school of Léonin and Pérotin—also tried out at the conference—was clarified through performance on this instrument. All present knew instinctively that they were in the presence of a special musical integrity and masterly instrument building.<sup>12</sup>

Another organ, of an altogether different, rather later style, was the largest of several provided by Walter Chinaglia. This remarkable *organo di legno* brought to mind a passage in Benvenuto Cellini's autobiography:

My father began teaching me to play upon the flute and sing by note; but notwithstanding I was of that tender age when little children like to take pastime in whistles and such toys, I had an inexpressible dislike for it, and played and sang only to obey him. At this time my father fashioned wonderful organs with pipes made of wood, spinets the fairest and most excellent which could then be seen, viols and lutes and harps of the most beautiful and perfect construction.<sup>13</sup>

What could be called Chinaglia's *Cellini* Principals are exceptionally fine ranks, made from a beautiful red-yellow cypress, which even contributes scent to the total experience of this organ. They run through the entire range of its keyboard at both 8' and 4' pitches. The third register, an exquisite Krummhorn-Regal with a beautifully full and rich quality in spite of its pencil-thin resonators, adds

a strong and spicy finish to the tonal resources.<sup>14</sup> He also brought along several positives and portatives, one very fine positive emulating that in the van der Goes painting in Scotland.<sup>15</sup>

Of particular interest to everybody at the symposium was a new interpretation of the ancient Roman organ finds from Aquincum (Hungary). It was built by A. Schuke Potsdam-Orgelbau GmbH (Germany) for the Römisch-Germanisches Zentralmuseum Mainz (Germany); research, design, and concept were by Susanne Rühling M.A. and Michael Zierenberg.<sup>16</sup> Extra time had to be allocated, taken from later sessions, allowing a second round of discussion about this amazing but potent little replica. It stood there, like a proud Roman sentinel, on its brown hexagonal pedestal, a living and working monument, mostly in copper or bronze, to the organ belonging to Aquincum's 3rd-century fire brigade. Its prototype ironically survived a fire by falling into the cellar. Were they all out that night? Perhaps the seemingly unanswerable question—"Was it a hydraulis or a bellows organ?"—might be given a nudge towards hydraulis, since its survival could have been the result of having water poured over it as it fell? It is doubtful that burning floors falling into cellars with highly flammable organ bellows would do anything more than increase the conflagration. Such speculations aside, this instrument looked more like something from the age of steam and polished brass. Indeed, its amazing sounds were quite reminiscent of steam whistles. Justus Willberg also tours Europe with a hydraulis,<sup>17</sup> complete with air-pumps, water cistern, pnigeus, and Greek repertoire, but following the older, Walcker-Mayer interpretation. He was in Basel not so long before the June event, another manifestation of this fascinating phenomenon. The sounds of these Roman organs seem not unrelated to the new Rims organ when first heard from a modern perspective, although they are in reality tonally, musically, and mechanically universes apart.

Another star of both events was the two-stop, one-manual and pedal positive made for the author in 2010 by van der Putten. This instrument was also partly influenced by the van der Goes painting. The organ and I had been invited to make the trip from Basel specifically to talk, play, and be played at this conference.

Much of the woodwork is Lebanese cedar, again contributing scent to the total experience. It was used in every concert and demonstration and featured twice on the cover of the flyer. (Rysum was the third.) The two Rhede flyer photos were taken at the Basel event by Jos van der Giessen where the Peterskirche appropriately provided a neatly framed, truly "Gothic" background.<sup>18</sup> The positive was moved from Laufen (Switzerland, near Basel) to Rhede (Germany), then Huizinge (Netherlands), Rysum (Germany),

Rhede (Germany), Groningen (Netherlands), Finsterwolde (Netherlands), and back to Laufen (Switzerland) during this northern sojourn—about 12 days.

The rest of the Rhede Symposium consisted of demonstrations, concerts, lectures, a church service, socializing, and networking. The invitees included Harald Vogel, Winold van der Putten, Koos van de Linde, Cor Edskes (paper read *in absentia*), Susanne Rühling, Winfried Dahlke, Jankees Braaksma, Tomas Flegr, and myself. Themes ranged

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## Medieval organbuilding

around gothic pipe-making, wind pressures, voicing, repertoire, performance practice, the problems and advantages in the anachronous use of tuning slides in modern copies of early organs, the towering figure of Arnaut de Zwolle, medieval organ design (cases, windchests, specifications, keys), the Blockwerk, surviving literature, touch sensitivity on portatives, the use of bells with medieval organs, Pythagorean tempering, and much more.

Time simply ran out. The richness of thematic material, available expertise, the many discussion by-products, and the ravenous cultural, intellectual, and musical hunger of all gathered together for this event turned out to be quite overwhelming for the organizers. Some speakers and players had to seriously curtail their offerings. Frustrating though this was, it should be no enduring problem as long as the need for more is acknowledged.

Thus it was that, on Saturday afternoon, September 8, 2012, momentarily lacking a program, I turned to Jos van der Giessen and asked, “When does this finish?” Even the fascinating unscheduled double session by Koos van de Linde (Netherlands/Germany) ranging from Arnaut de Zwolle to the much-discussed Utrecht Nicolaïkerk organ restoration<sup>19</sup> was not fully done. Three more speakers were impossibly scheduled in the 30 minutes before the close at 4:30 pm. My question was intended to be “When does this (session) finish”—but the response fittingly, amusingly, and intentionally misinterpreted it, summing up the spirit which had been engendered by all the 2012 events: “Never, I hope!”

For the phenomenologists, at least four medieval organ events in around four months—Basel, Netherlands, Rhede, Sion—must be something of a landmark for 2012.

Immediately following the Rhede Symposium, on Sunday, September 9, after the closing church service in Rysum, a further concert was held in Groningen’s De Oosterpoort Concert Hall. Arrangements had been made that my instrument would remain in the Netherlands for a few days before being returned to Switzerland. Jankees Braaksma (Netherlands)



David Rumsey and Kimberly Marshall at the Rumsey organ’s inauguration Laufen (CH), April 2010 (photo: Gabriele Lewon)

and Tomas Flegr (Czech Republic) played it with the group *Vox Resonans*, the ensemble adding that sparkle and transformed sound that has been frequently noted with this organ: those who had attended both events were still commenting on Tobie Miller’s hurdy-gurdy playing in Basel and the amazing soundscapes created when *organistrum* and *organum* are played in ensemble. The dance group, RenaiDanse,<sup>20</sup> led by Veronique Daniels (Switzerland), and instrumentalists also featured in two of the Rhede Symposium concerts as well as this Groningen event. They all earned a double standing ovation in Groningen—one after the concert, another after the encore. The *calcant* (the organ’s builder), physically exhausted and suffering from a serious workshop injury incurred just before the symposium, was fittingly included with the performers in these accolades.

### Quo vadis?

The many themes raised by these conferences can only be dealt with through an enduring continuum of instrument building, research, discussion, publication, and many more such events. This arena is a collection of musical swords that still need much more rattling in their scabbards. Basel and Rhede together



Jankees Braaksma (recorder) in rehearsal with RenaiDanse (photo: Jos van der Giessen)

were able to pose important questions, and even answer some, at least in the short term. But long-term answers are needed, since both the practice and the research is relatively recent, tends to be revelatory, and is ongoing—very much an essential part of the phenomenon.

There were questions posed about the nicknaming of the Rutland Psalter copy as a “Theophilus” organ. Of course, with hindsight we can now view this as two ends of a historical progression and clearly distinguish between them as organ types. Simple, well-intended glossing can grow into habits that become less correct as time progresses. Such expressions tend to stick, even when more recent knowledge overtakes them. Another habit of this kind began to be formed at these conferences when—rightly enough as a new venture in recreating pipe-making history—the so-called “pigeon’s egg” registers (three on the Rims organ, one on the Rumsey organ) were referred to just so: “pigeon’s egg ranks.” The term comes from the 11th-century Codex Bern (see endnote 9), where the measure of pipe diameters is explained as “the width of a pigeon’s egg.” Yet the eggs chosen were different and correctly discriminated between the eras the two instruments represented. Thus the ranks were not scaled to the same widths. The terminology really should have been “constant-scaled.” After that we might talk ancient treatises and ornithology.<sup>21</sup> Likewise, in discussing the “wolf” in Pythagorean tempering, the interval really should have been referred to as “b to g,” rather than “b to f<sub>4</sub>.” And what were referred to as “pure thirds” are in fact just ever so slightly impure acoustically, since they are really Pythagorean diminished fourths, e.g., d–g, which are 384.36 cents, whereas a truly pure major third is 386.31 cents. True, normal human perception cannot distinguish between them.<sup>22</sup> Again, strictly speaking, the hydraulis presented was closer to a bellows organ.

These matters need little further comment here; the intention is clear in every case once the context is clarified and human nature to gloss, nickname, and abbreviate is acknowledged. Exact terminology usually sorts itself out eventually as needs arise and awareness increases—although a general tendency to slow progress is lamentable.

What needs probing now includes the following:

**Medieval Tuning and Tempering:** A frequent modern assumption that earlier Pythagorean temperaments mostly had the “wolf” at G<sub>2</sub>–E<sub>3</sub><sup>23</sup> seems only rarely to be hinted at in ancient sources. It has sometimes been recommended or



The Rims organ: two 8’ ranks and one 6’ rank all with the same (27mm, “pigeon’s egg”) diameter (photo: Jos van der Giessen)

assumed by exponents of this culture, including Mark Lindley, although often with serious reservations or caveats.<sup>24</sup> Others, such as Adam B. Rahbee, are known to be investigating this.<sup>25</sup> Further results are eagerly awaited from him and others. However, the most likely outcome, endemic to this medieval discipline it would seem, is that there was no single standard. One particularly fascinating development of this was how, in the half-century or so before Schlick (the work of Arnaut de Zwolle, Pietro Aaron, et al), the pure thirds/diminished fourths were shifted and came into line with four of what became mean-tone temperament’s normal eight.<sup>26</sup>

**Fingering:** The use only of 2nd, 3rd, and 4th fingers when playing medieval keyboard music was strongly promoted in the Rhede masterclasses. There was a claim that it was impossible to use thumb and 5th finger anyway, especially when playing portatives. Yet this was proven wrong by at least one participant, who repeatedly and comfortably used all fingers. When an octave span is required in, e.g., a 3-part *Buxheim*<sup>27</sup> piece, and it can only be played by one hand because the other is too far removed to help out, then how can the thumb *not* be used, especially if the keys are substantially wider than modern keys and there is no pedal? (Horror of horrors: was the rule of exclusively 2nd, 3rd, and 4th fingers partly formulated by people playing relatively narrow modern keyboards?) Aside from Tobie Miller’s hurdy-gurdy playing in Basel, the finely fingered performances by Brett Leighton—who takes Buchner’s *Fundamentum organisandi* of c. 1520 and his *Quem terra pontus* as a point of departure—also linger very well in collective memory.<sup>28</sup>

**Music and its structures:** Much of the medieval repertoire could have been intended for constant-scaled ranks. The music of *Robertsbridge*<sup>29</sup> and *Faenza*<sup>30</sup> seem often to rely on the development of tension through tessitura variation and the relation of this to changing tonal qualities induced by scaling practices. *Redeunt*, for example, sound wonderful on constant-scaled ranks as the figuration rises and falls. This music thrives on “intensity climaxes” that higher-pitched, fuller and flutier constant-scaled ranks produce. No modern scaling can possibly achieve this. The first *Estampie* from *Robertsbridge* has one “punctus” after another, each getting successively higher than the preceding, until the final one just blooms with the highest and most intensely flutery notes of all. It is not just constant-scaled ranks but also other scaling practices from this era—e.g., Arnaut’s “halving on the octave with addition

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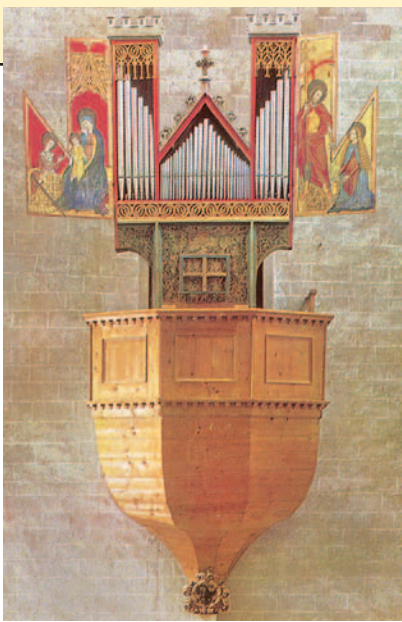
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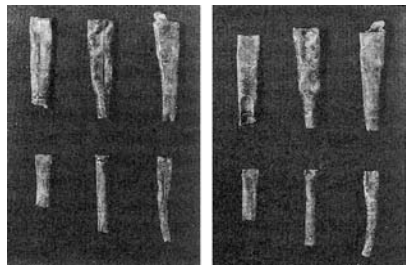
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The Sion organ: possible original appearance without the added pedal pipes behind (Photoshop alterations by David Rumsey)



Hamar's apparently conical flue pipes(\*)



Winold van der Putten explaining his 1999 Rutland (l) and 2010 Rumsey (r) positive organs (photo: Jos van der Giessen)

constant”—that can produce this effect. Essentially all early scaling practices do to varying degrees, but the more scaling practice approaches modern schemes, such as Töpfer's norms,<sup>31</sup> the less marked this effect becomes, and the music ends up sounding relatively flat and lifeless.

**Metallurgy**—copper, lead, tin, and alloys—plays a most critical role. The use of wood for pipes is another question, particularly the issue of its first clearly recorded use—Italy, late 15th century.<sup>32</sup> The Sion (Switzerland) Valeria organ has a “Copel” made from wood, now dendrochronologically dated from around early 15th century.<sup>33</sup> Of course, wood was introduced at some stage between the hydraulis and Arnaut de Zwolle as a material replacing the earlier copper/bronze variants used in making windchests.<sup>34</sup> Similarly, early conical metal pipe-forms and the potential confusion they cause in the iconography with wood needs investigation.<sup>35</sup> The relics at Hamar, Norway, may eventually provide a key.

The apparently sudden change from copper/bronze to lead at the turn of the 13th century is an interesting phenomenon: that lead was far more malleable than copper may have been a driving motivation clinching change. But the tonal effect was so strikingly softer and sweeter that this was expressly noted in many contemporary tracts.<sup>36</sup> It must have come as a profoundly exciting development, part of the *Ars Nova*/*Ars Antiqua* watershed. Notated organ music first consistently appeared just after the change—some of it might suit the sound of tin or copper but most of it plays remarkably well on lead pipework. Did the notion of accompanied voices rather than *alternatim* also receive some kind of stimulus here? And the desire to separate a single 8' out from a Blockwerk: was this also part of the switch to lead? Later register names, such as Doof, hint at this, for the softer tones of lead must have seemed “deaf” compared either to copper pipes or the presence of upperwork of any kind. It was mainly in the centuries after this change that the typical, relatively small, medieval organ began to share the stage with some increasingly multi-ranked Blockwerks. The facility of the larger Blockwerks to be reduced to a single, sweet foundation rank must have been very alluring, whether for accompaniment or contrast.

Blockwerk registrations were sometimes recommended for pieces played by participants in Rhede—but how many organs pre-15th century had more than about one, two, or three ranks? Two of these ranks were often enough simply a doubled unison. The most spectacular Blockwerks were reported by Wulstan at

Winchester in the 10th century or Praetorius at Halberstadt in the 14th or 15th century. Were some of these chroniclers, like us, more impressed with size—or hooked on hyperbole—than with making sober inventories of what was really there? Certainly, the three-rank Rims organ was closer to many Blockwerks of that era than the concept of a “Lokaz of at least 50 ranks,” to cite Schlick at the end of the era around 1511. And the Winchester organ: did this have copper pipes? Presumably. Was that—apart from its apparently anachronistically large mixture—another reason why it was reported as being so loud? *Prima facie*, sources and iconography prior to the 15th century indicate the existence of relatively few large Blockwerks compared to the many Positives and Portatives.

As with scaling, pitch, keyboard design, metallurgy, and everything else about medieval organs, there were no DIN specifications. Any investigative path is flawed if standards like this are sought. A variety of options needs to be tried within known tolerances, then optimums and limits found. Assessments can then follow, which might be region-, collection- or even specific work-oriented. It would be wonderful if some day money could be found to build an entire series of constant-scaled ranks from very

thin to quite wide scaling, note the true ranges available, and try out repertoire on them, for instance that spanning the era between the *Robertsbridge Codex* and *Buxheimer Orgelbuch*. If further funding were available, then some copper pipes might also be tried, not for keyboard repertoire before this, since it virtually does not exist, but for ensembles (especially those commonly iconographically represented) and *alternatim*.

Did some or all the music in *Faenza* assume copper pipes, lead pipes, tin pipes, alloys? Constant or variable scaling? Pitches equivalent to A440, A466, A520 or something else? And where to place the “wolf”? A520, lead pipes, early Pythagorean tempering, and constant scaling certainly seem to work very well. But are our criteria correct? The experience of beautifully pure major thirds from Renaissance mean-tone tempering, or major thirds ranging from pure to mistuned in the circular temperings of the Baroque era, is very enticing to impressionable musicians travelling back from an accustomed equal tempering. Yet the sober reality is that pure thirds were sometimes expressly avoided, e.g., by Bach using remote keys with dissonant thirds to represent crucifixion, or even just sheer doggedness as with Thomas Roseingrave's self-proclaimed

love of F–G<sub>2</sub> rather than F–A<sub>2</sub> in his deliberate choice of a “nasty” F-minor tonality. Was the Pythagorean “wolf” sought out in like manner, or studiously avoided by these earlier musicians? Probably it was avoided if the evidence of modal transpositions is taken at face value—but even here there are questions that need working through.<sup>37</sup> In any case, there is no significant evidence in medieval music for an *Affektenlehre* and *Figurenlehre*: that was the culture of Bach, Handel, and Roseingrave.

To a degree, medieval voicing seems somewhat weather-prone: what barely works one day, might work well or not at all in the next cold snap or heat wave. And the organs of those days were only marginally protected from weather change compared to ours in air-conditioned buildings today. Thus: were their tolerances of pitch and tuning, including in ensemble, and with bells, more flexible than ours are today? Within limits, slight differences actually make these organs more interesting, as do historical voicing techniques—particularly the lack of total control with wide-open footholes. The lowest generally workable pitch from 27mm constant-scaled lead pipes is about modern (A440) tenor E<sub>2</sub>. With 33mm it extends down to B<sub>1</sub>, a fourth lower. Thus, pitches of organs produce differing manual compasses, or a few low pipes with ears needed to make them speak. As Winold van der Putten pointed out in Basel, “Medieval organ builders were no fools: it only takes cupping a hand around a pipe mouth to make it speak.” Iconography showing ears is, however, extremely elusive—jury out, experimentation and investigation still in. If, as seems likely, constant scaling was perpetuated well after the 11th century, whence these “pigeon's egg” figures derive, then diameters could well have increased in time, allowing lower bass ranges and even more blooming trebles. The iconography, *inter alia*, suggests that this tendency could have persisted until early 15th century as diameters apparently became wider.<sup>38</sup> A targeted study of this is overdue.

If we retain all the parameters noted above, then reduce the size of the pigeon's egg taken to 27mm, as with the Rims organ, little of *Robertsbridge* and *Faenza* at its notated pitch can be played satisfactorily unless the instrument is higher than

## Medieval organbuilding

A440. The very low notes cannot be voiced reliably using known medieval tools and techniques. Yet Léonin, Pérotin, or the *Felix Namque* of the Oxford MS sound totally convincing here with their more agile trebles—everything just bringing this music to a radiant vitality. The same applies for other parameters with *Buxheimer, Ileborgh*,<sup>39</sup> or various regional- or even specifically single-work instances.

Even so, did Léonin and Pérotin ever know lead pipes?

Research and experimentation not possible hitherto has now shown that constant scaling with pigeons' egg dimensions around 33mm, and a pitch of at least A465 makes the first *Estampie* from *Robertsbridge* sound simply magnificent when transposed up a tone. That equates to A520—which should make some players of medieval instruments happy, since many project that pitch for some of their repertoire. All this, or an even higher pitch, brings "43" from *Faenza* truly to life in 33mm constant scaling. Lower that pitch and the bass notes of the *Estampie* are poor or missing, while the overall effect of "43" is relatively dull from trebles that simply do not bloom so well.

Of necessity, these assessments will always have a component of subjectivity in them. But not entirely: low pitches and constant scaling yield bass notes that do not repeat promptly, and others that will not speak properly, if at all—indicators that either pitch is too low, scaling too narrow, or later scaling practices could be appropriate. The physical limits of medieval organ compasses and pitch now need probing and defining. Any temptation to a general conformity of anything—pitch, scaling, metal alloy, tempering, fingering—must be addressed as a range or tolerance, given a specific set of parameters. This expressly includes repertoire and ensemble playing.

Standardization was a new concept that had to wait for Arnolt Schlick and later centuries. Interestingly, Schlick, relatively modern by comparison to the main thrust of these conferences, barely made it into the discussions.

### A sequel?

Thus, there was a consensus that intellectual and musical exchange should not simply vanish after this flush of medieval organ symposia during the European summer of 2012. Several events are already known to be foreshadowed. Of considerable interest will be a major symposium planned for the Amsterdam Orgelpark, June 6–8, 2013.<sup>40</sup> Wherever future events are held, it would be most welcome if they were not primarily talk-fests, but also included strong performance components. One small



Paris, Bibliothèque Nationale 13096, fol. 46, *Mer de cristal* (used with kind permission of M. Moleiro)

criticism of the Rhede Symposium was its predominance of talk over music. A four-way balance will always be needed with medieval organ cultures: talk, solo organ, alternatim, and in ensemble. In a way, these instruments were born to work in alternation with speech, chanting, silence, and possibly bells. It is particularly in ensemble that the iconography, literature, and extant music seems to be signposting the way ahead. Both Basel and Rhede showed that all four are needed for a completely balanced presentation of this highly fascinating culture. Basel strongly promoted alternatim and ensemble, and so did Rhede, the latter chiefly in concerts where dance was also represented. Would the miracle or mystery plays of the era be a good suggestion for some future events?

The *Mainzer Hoftag* of 1184 is usually reckoned as the greatest medieval festival in history. It was here that Friedrich Barbarossa knighted his sons, Heinrich VI and Friedrich V. A contemporary description of it included these lines:<sup>41</sup>

Dâ was spil end gesanc  
End behurt ende dranc,  
Pipen ende singen  
Vedelen ende springen,  
Orgeln ende seitspelen,  
Meneger slachten frouden vele.

There was playing and song,  
And pushing and shoving,  
Piping and singing,  
Fiddles and dancing,  
Organs and strings playing,  
Many joyful things mingling.

### Epilogue

The standing ovations in Groningen mentioned above had something of a cathartic feel to them, reflecting the exegesis in medieval organbuilding and musical performance that has taken place over the past several decades, especially



Emulating Gerritsz, 1479 at Amsterdam Orgelpark (used with permission by Hans Fildom of the Amsterdam Orgelpark)



Rodin's organ thinker? A rare moment's rest for Winold van der Putten, ready as calcant for his "Rutland" organ (photo: Jos van der Giessen)

in the events described above. Winold van der Putten's organs were not at all alone in this, but he and his work were at the center of two of these conferences.<sup>42</sup> His 1999 realization of the copy of the Rutland Psalter organ was an important trailblazer. This instrument was featured at the Rhede conference, along with some portatives for Jankees Braaksma and his group, Super Librum.<sup>43</sup> These were prototypes for most of what has followed as van der Putten and others investigated, experimented, and cracked the codes of medieval organbuilding and voicing. His recent constant-scaled ranks for myself and the Rims instrument were essayed only after much investigation and experimentation. In their own way, they alone deserved their rightful share of those standing ovations. Medieval organ scaling of this kind now seems set to be one of the next "revelations" in the performance of this music—not least in portatives where, oddly enough, it remains relatively untried. ■

*David Rumsey*<sup>44</sup> was born and educated in Sydney, Australia. He studied with Anton Heiller and Marie-Claire Alain in Europe 1963–66, then returned to a position at the University of Adelaide. Moving back to Sydney in 1969 he established a Department of Organ and Church Music, which survives the recent Australian educational and research funding cuts. For over 25 years, until 1998, he was the regular organist with the Sydney Symphony Orchestra and as such frequently presided over the Grand Organs of Sydney Opera House and Sydney Town Hall. Associations with multimedia events have included performances of the Saint-Saëns "Organ Symphony" to 100,000 people with the orchestra in the Sydney Domain, the organ via microwave link from Sydney Town Hall. In 1998, he wrote, produced, acted, and performed in a highly successful 14-hour musical and dramatic spectacle on the life of J.S. Bach, with actors in period

costume from the National Institute of Dramatic Art (AUS), and musicians playing period instruments. He resigned his post in Sydney in 1998 and moved to Basel, Switzerland, where he continues working as an organist and consultant, and as a Senior Researcher at the University of Bern. Since 2007 he has been responsible for the editing and CD-production of historic organ recordings released under the OehmsClassics label using the historic Welte organ and its player-rolls at Seeven (SO-CH) and is regarded as an authority on aspects of medieval organ culture. He is organist at Herz Jesu Kirche in Laufen (BL-CH) and in-house consultant and organist to the Museum der Musikautomaten, Seeven (SO-CH).<sup>45</sup>

### Acknowledgements

(\*) Seemingly the only images currently available, taken here from Stein Johannes Kolnes, *Norsk orgelkultur—Instrument og miljø frå mellomalderen til i dag*, Det Norske Samlaget, Oslo, 1987.

Thanks to John Liddy, Jos van der Giessen, Marc Lewon, and Elizabeth Rumsey for their help with this article, and to all who contributed photos and good advice. My apologies to Walter Chinaglia for not writing more about his *organo di legno*—space allocation just became too acute and this instrument really belongs to a slightly later epoch than the one mainly under discussion here. A fuller report on it can be seen at <http://www.davidrumsey.ch/Chinaglia.htm>.

### Notes

1. Some details are available at [www.davidrumsey.ch/Medieval.php](http://www.davidrumsey.ch/Medieval.php).
2. [www.ostfriesischelandschaft.de/1097.html](http://www.ostfriesischelandschaft.de/1097.html)
3. Kimberly Marshall, *Iconographical Evidence for the Late-Medieval Organ in French, Flemish, and English Manuscripts* (New York: Garland Publishing, 1989), ISBN 0-8240-2047-2.
4. A description of the background to this, including mention of an earlier instrument by Yves Cabourdin, is available in Marcel Pérès, editor, *Les orgues gothiques: Actes du Colloque de Royaumont, 1995* (Paris, Editions Créaphis, 2000).
5. [www.organa.it](http://www.organa.it)

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6. www.marcus-stahl-orgelbauer.com  
7. Wolkensteyn Orgelbau—also represented at the Basel event—www.wolkensteyn.de. He is arranging a course March 8–10, 2013, the “13. Etappe zur Frühen Musik,” dealing with Organetto/Portative playing, to be held at Burg Fuersteneck. Details on his website.

8. www.davidrumsey.ch/Bibliography.htm (see under 11th century)

9. Anonymous of Bern(e) or Codex Bern, Anonymus Bernensis etc., excerpt *De fistulis organis/De organis*.

10. In Michael Praetorius, *Syntagma Musicum*, Volume II, Wolfenbüttel 1618 (1619/20), section V, and Volume III 1619, section 7: “Das I. und II. Diskant-klavier.”

11. Oxford Douce MS 381

12. An *alternativ* (*Veni creator spiritus*) from an *ad hoc* Rhede performance can be heard at <http://www.youtube.com/watch?v=PgtszdCw91o&feature=youtu.be>.

13. John Addington Symonds (1840–1893), trans., *The Autobiography of Benvenuto Cellini*, Chapter V. It is now available online as part of the “Gutenberg” project (see [www.gutenberg.org/ebooks/4028](http://www.gutenberg.org/ebooks/4028)).

14. Further details at: [www.organa.it/page1/page14/page41/page41.html](http://www.organa.it/page1/page14/page41/page41.html).

15. Hugo van der Goes, *Ange jouant de l'orgue (Angel playing the organ)*, Flemish ca. 1480, Sir Edward Bonkil, Holyrood Castle, Edinburgh collection. For a sample (second from left) see [https://d30dcezuokq8w8.cloudfront.net/works/r/bal/6/8/0/399086\\_full\\_1024x520.jpg](https://d30dcezuokq8w8.cloudfront.net/works/r/bal/6/8/0/399086_full_1024x520.jpg).

16. [www.schuke.com/pages/de/projects#reconstructions](http://www.schuke.com/pages/de/projects#reconstructions)

17. [www.hydraulis.de](http://www.hydraulis.de)

18. Remains of a hydraulis were excavated in Dion, Greece, in August 1992. A reconstruction has since been toured. See Peter Williams and Jean-Paul Montagnier, eds., *The Organ Yearbook #33* (Laaber: Laaber-Verlag, 2004), p. 163; Michael Markovits, *Die Orgel in Altertum* (Leiden: Brill, 2003); and websites: [www.culture.gr/2/23/232/epked/en/00\\_standard\\_menu/00a\\_ydraulis/00a.htm](http://www.culture.gr/2/23/232/epked/en/00_standard_menu/00a_ydraulis/00a.htm) and [www.mlhanas.de/Greece/Cities/Dion.html](http://www.mlhanas.de/Greece/Cities/Dion.html).

19. See Peter Williams, ed., *The Organ Yearbook #41* (Laaber: Laaber-Verlag, 2012), pp. 7–35. Program at [www.davidrumsey.ch/index.pdf](http://www.davidrumsey.ch/index.pdf), images at [www.davidrumsey.ch/2012/album/index.html](http://www.davidrumsey.ch/2012/album/index.html).

20. [www.renaidanse.org/page/de/act.html](http://www.renaidanse.org/page/de/act.html)

21. The sizes of pigeons' eggs are discussed in a footnote to Part II, Section I, of Christhard Mahrenholz, *Die Berechnung der Orgelpfeifenmessungen vom Mittelalter bis zur Mitte des 19. Jahrhunderts* (Bärenreiter, 1968); also in English translation (Oxford: Positif Press, 1975).

22. See also [www.davidrumsey.ch/tempering.pdf](http://www.davidrumsey.ch/tempering.pdf).

23. Really not a quint at all, but a diminished sixth, which has to function as a quint on the vast majority of keyboards where no split keys provide any better-tuned alternatives. This also applies to diminished fourths, which, in the Pythagorean temperings under discussion here, more accommodately or even fortuitously provide a near-pure major third.

24. An important essay on this subject by Mark Lindley can be found online at [http://independent.academia.edu/MarkLindley/Papers/242254/Pythagorean\\_intonation\\_and\\_the\\_rise\\_of\\_the\\_triad](http://independent.academia.edu/MarkLindley/Papers/242254/Pythagorean_intonation_and_the_rise_of_the_triad). See particularly Table 2, page 27, and the general discussion involving Odington, Spechtshart, et al. Certainly he presents much evidence for the B–G<sub>2</sub> wolf having more than a century's demonstrable currency from 1413 to 1513 and correctly reminds us that the organ's tuning cultures were often at variance with those of other instruments. The only significant assertion he makes for a G<sub>2</sub>–E<sub>3</sub> wolf is for *Robertsbridge* (p. 33). Another essay, by Margo Schuller, can be viewed at [www.medieval.org/emfaq/harmony/pyth4.html#1](http://www.medieval.org/emfaq/harmony/pyth4.html#1). See especially around “4.5 Pythagorean tuning modified: a transition around 1400,” where she assumes a G<sub>2</sub>–E<sub>3</sub> wolf. In the final analysis, these do not argue very convincingly for a wolf at G<sub>2</sub>–E<sub>3</sub> on purely statistical grounds. Of course, this only became a pressing issue when keyboards came to be divided into 12 or more discrete notes.

25. E.g., in a series of e-mail exchanges between Rahbee and the author dating June 28 to July 22, 2012. He is particularly interested in 15th- and 16th-century tempering practices and takes such relatively new material as the Cambrai MS into account (see Patrizio Barbieri, “An Unknown 15th-century French Manuscript on Organ Building and Tuning,” in Peter Williams, ed., *The Organ Yearbook #20* [Laaber: Laaber-Verlag, 1989]). Rahbee is also exploring a hypothesis that meantone tempering may have come into widespread use somewhat later than is commonly believed. The apparently dual-tempered instruments of late 15th century, e.g., the Lorenzo da Pavia style of organ, may yet have much to offer on this topic. See <http://www.davidrumsey.ch/Iconography.pdf>, pp. 7 and 8, and Marco Tiella, “The Positive Organ of Lorenzo da Pavia (1494),” in

Peter Williams, ed., *The Organ Yearbook #7* (Laaber: Laaber-Verlag 1976), pp. 4–15.

26. With a B–G<sub>2</sub> wolf giving near-pure major thirds (really diminished fourths) on A, D, E and B as opposed to the four (from a G<sub>2</sub>–E<sub>3</sub> wolf tuning) quasi-pure major thirds on B, G<sub>2</sub>, F<sub>2</sub>, C<sub>3</sub> (see also endnote 22). This awakens interest in the potential adaptation of Pythagorean/B–G<sub>2</sub> tempering—seen as part of a transition to meantone—bearing, e.g., on the E-major/e-minor tuning dilemma in some Bruhns and early Bach organ works.

27. *Das Buxheimer Orgelbuch*, MS 3725, Bayerischen Staatsbibliothek, München.

28. Leighton's point of departure is that Buchner was a Hofhaimer pupil, barely outlived his master, and most likely merely codified what he had been taught. The “good” fingers are 2 and 4, with scales played on lower keys executed, r.h. ascending and l.h. descending, as 2-3-2-3 (starting on strong beats), r.h. descending and l.h. ascending as 4-3-2-3-2-3, turn figures r.h. high-middle-low-middle and l.h. low-middle-high-middle as 4-3-2-3. The hand can be turned in the direction of travel when using paired fingerings (turning the hand in the direction of movement and keeping the fingers parallel to the keys were techniques used in the outgoing 16th century, their relative employment before that is a matter of speculation; Santa Maria and Diruta were in disagreement about this). Thumbs and fifth fingers are used in both hands (especially the left) when larger intervals require them. The iconography indicates use of left thumb when that hand played longer note values in three parts. Impractical passages sometimes need rule-breaking exceptions. Prohibition of using the same finger twice in succession is not endorsed in *Quem terra pontus* (which seems to have been fingered by a scribe rather than Buchner) and in polyphony, finger repetition is often the best musical and technical solution. (E-mail correspondence of 12.11.2012-3.12.2012).

29. *Robertsbridge Codex/Robertsbridge fragment*, London, British Library Add. MS 28850.

30. *Faenza Codex*, Faenza, Biblioteca Comunale, ms. 117.

31. See J.G. Töpfer, *Lehrbuch der Orgelbaukunst*, in 4 volumes (Weimar, 1855, and Mainz: Rheingold-Verlag, 1955–60).

32. See [www.davidrumsey.ch/Technology.htm](http://www.davidrumsey.ch/Technology.htm).

33. See Friedrich Jakob et al. in *Die Valeria-Orgel. Ein götisches Werk in der Burgkirche zu Sitten/Sion* (Zurich, Verlag der Fachvereine, 1991), ISBN 3-7281-1666-1 and the updates in *La Tribune de L'orgue*, ed. Guy Bovet (Geneva), in numbers 56/3 and 61/2. A subsidiary issue here is that many of the older metal pipes at Sion appear not to have been hammered, but retain a thick, rough—even slightly porous?—post-casting appearance.

34. As noted, e.g., by Markovits in *Die Orgel in Altertum*. See, e.g., pp. 342, 418, and especially p. 444, where metal scarcities in the middle ages are said to have driven the change to wood, etc. (cf. pp. 198). Note also the tin or copper/bronze-veneered wooden plates of windchests. This book is also available for viewing online at [http://books.google.ca/book?id=p7amFlH7Bg0C&pg=PA401&source=gs\\_bstoc\\_r&cad=4#v=onepage&q&f=false](http://books.google.ca/book?id=p7amFlH7Bg0C&pg=PA401&source=gs_bstoc_r&cad=4#v=onepage&q&f=false).

35. A need to be cautious here is underscored by an illusion in some representations, such as that of the *Dame à la Licorne* tapestry (<http://www.davidrumsey.ch/Iconography.pdf>, p. 5), where the pipe tops appear cylindrical, but lower down, under the bar, seem square.

36. E.g., see [www.davidrumsey.ch/index.pdf](http://www.davidrumsey.ch/index.pdf)—the Jerome de Moravia quote. In that connection a question (cf. Markovits endnote 33 above) that needs raising may well be: If metal was scarce, then what drove the change to lead so strongly (and e.g., not to wood)?

37. Lindley (op. cit., p. 5) for example claims that most of Buxheim seems “. . . in certain cases at least, to require some form of meantone temperament for its proper effect” but gives no clear criteria. My own experience is contrary to this, having tried both, and I am mostly very comfortable with a Pythagorean/B–G<sub>2</sub> wolf for *Buxheim*. Criteria of this kind are difficult to formulate, save to note that resting points in the music, apart from open fifths and octaves, seem often enough to occur with the near-pure thirds of e.g., an A-major or D-major triad (a feature also noted by Lindley, pp. 42–43). We have to face the fact that medieval musicians themselves applied no consistent criteria here—a proposition that Lindley gives credence to with his quotation (p. 4) of the Spataro/Gaffurio and many other bitter contemporary conflicts around such issues. By virtue of its three additional pipes per octave, the medieval organ built by Winold van der Putten for me in 2010 is capable of playing in a variety of early Pythagorean temperings. With options of pipes to play either D<sub>2</sub> or C<sub>2</sub>, G<sub>2</sub> or F<sub>2</sub>, and A<sub>2</sub> or G<sub>2</sub>, this currently allows any of the following tempering configurations:

Wolf G<sub>2</sub>–E<sub>3</sub>: E<sub>3</sub>, B<sub>3</sub>, F C G D A E B F<sub>2</sub> C<sub>2</sub> G<sub>2</sub>  
Wolf C<sub>2</sub>–A<sub>2</sub>: A<sub>2</sub>, E<sub>3</sub>, B<sub>3</sub>, F C G D A E B F<sub>2</sub> C<sub>2</sub>  
Wolf F<sub>2</sub>–D<sub>2</sub>: D<sub>2</sub>, A<sub>2</sub>, E<sub>3</sub>, B<sub>3</sub>, F C G D A E B F<sub>2</sub>



David Rumsey about to play the Rysum organ Sunday September 9, 2012 (photo: Jos van der Giessen)

Wolf B–G<sub>2</sub>: G<sub>2</sub>, D<sub>2</sub>, A<sub>2</sub>, E<sub>3</sub>, B<sub>3</sub>, F C G D A E B E<sub>3</sub>/D<sub>3</sub> and B<sub>3</sub>/A<sub>3</sub> choices (not yet built 2012) would further increase these options with:  
Wolf D<sub>2</sub>–B<sub>2</sub>: B<sub>2</sub>, F C G D A E B F<sub>2</sub> C<sub>2</sub> G<sub>2</sub> D<sub>2</sub>  
Wolf A<sub>2</sub>–F<sub>2</sub>: F C G D A E B F<sub>2</sub> C<sub>2</sub> G<sub>2</sub> D<sub>2</sub> A<sub>2</sub>  
So far a lack of available time has allowed only limited exploration of these variants.

38. [www.davidrumsey.ch/Iconography.pdf](http://www.davidrumsey.ch/Iconography.pdf)

39. *Incipiunt praeludia diversarum notarum secundum modernum modum subtiliter et diligenter collecta cum mensuris diversis hic infra annexis* by Adam Ileborgh of Stendal, 1448 (Ileborgh: Paris, private collection [Ileborgh Tablature]).

40. [www.orgelpark.nl/pages/home](http://www.orgelpark.nl/pages/home)  
41. Quoted in Jean Perrot, *The Organ, from Its Invention in the Hellenistic Period to the End of the Thirteenth Century* (London: Oxford University Press, 1971, ISBN 0 19 318418 4), trans. Norma Dean, p. 268. Perrot is sourcing this from Th. Gérold, *La Musique au Moyen Age* (Paris: Champion, 1932), p. 419.  
42. [www.orgelmakerij.nl](http://www.orgelmakerij.nl)  
43. [www.superlibrum.nl](http://www.superlibrum.nl)  
44. [www.davidrumsey.ch/index.php](http://www.davidrumsey.ch/index.php)  
45. [www.bundesmuseen.ch/musikautomat/en/index.html?lang=en](http://www.bundesmuseen.ch/musikautomat/en/index.html?lang=en)

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