Homage to . . . Robert Hope-Jones

by Stevens Irwin

Part II

In the first installment we examined some of the organ voices developed by Robert Hope-Jones and his co-workers, adoption of the rotary forge blower as a wind pressure source, improvement of switches and windchests, swell shutters and the initiation of electro-pneumatic action. We also noted the names of many of the master's co-workers whose work is so often credited to Hope-Jones.

Hope-Jones' swell shades were one of his special projects, perhaps because many of his organs contained fewer than 15 ranks, and he tried to make soft stops out of loud ones, and also because his Pedal Organs had only a few stops in them. He made many types of swell shutter but he is remembered for those that were four inches thick and of laminated wood, some with sheets of lead on one or even both sides. The greatest sweep in loudness he obtained was around 38 decibels, which is unusual indeed, considering the fact that the Concert Model of the Hammond, when it had several speakers was around 48 decibels. He used long grooves in the matching edges of shutters to trap the energy in the waves; this further made the sounds soft, as well as absorbing high partials. A few experimental shutters he made from metal, occasionally with vacuumed hollow centers. He often put shutters on the tops of chambers for better spatial distribution and also to cover up mechanical noises. This tended also to add an air of mystery to the tones. He used reflector boards to thrust sound outward. Closing the swell shoe on any organ does more than diminish loudness; it also decreases brightness, which depends upon the number of higher and weaker overtones reaching the ear. Closing the swell is the equivalent, therefore, of enlarging scales, raising cut-ups of mouths, depressing languids, and decreasing wind pressure. All of these factors decrease brightness in a flue stop. Opening the swell shoe seems to do the opposite of these. Closing the swell on reeds is the equivalent of making shallots wider with smaller openings, increasing top diameters of resonators, and lessening curvature of tongues. It may also seem to increase pressure, as this wipes out some "highs" in Oboes, for example. Thus it can be seen that the swell shoe is a source of new timbres as well as a change in loudness, especially in "live" rooms.

Our favorite builder not only introduced higher wind pressure with his new blower, he also used a great variety of pressures in his organs. What modern builder would want to pay for his elaborate wind-trunking? He knew that higher wind makes a more unctuous, smooth, ingratiating timbre in both reeds and flues. This is true even in bright timbres, as for example, his quite dazzling Orchestral Oboe, which was far more brilliant than its orchestral counterpart, and therefore deserved to be called a new concept in tone. In most imitative stops, the pipe organ makes its own special variety of timbres. Hope-Jones regulated his pipes by changing the size of the toe-hole. Thus he could make an Echo Dulciana on 20 inches of wind by making a small toe-hole. This made for more permanent voicing, and was much easier to maintain through the years. He got right to the heart of redesigning the organ by developing a stable and adequate wind supply. He overcame the tendency of high wind to flatten the pitch of reed pipes.

Not the least of problems of any voicer is making the structural formant behave. The formant* is the peculiar series of (mostly) inharmonic partials that sound from the physical structure of the pipe itself – i.e., its walls. They are in the making of a good tone but

*"Formant" is a controversial word in pipe organ circles. It is doubtful that Hope-Jones knew the word. It was introduced by telephone engineer Harvey Fletcher in the mid-'30s to describe certain voice characteristics encountered while doing research work on voice-frequency transmission equipment. It was practically unknown until aired widely by Dr. C. P. Boner of the University of Texas, after which it was picked up by electronic organ builders and applied to tone production characteristics. However, it is not mentioned in treatises on organ building by such prominent authorities as Anderson, Audsley, Topfer, Robertson, Matthews, Elliston and the Herbert Normans (father & son). Nor does the 10-volume Century Dictionary list it. "Formant" is used by Bonavia-Hunt in his 1950 "Modern British Organ" and Austin Niland mentions it once in his "Introduction to the Organ." For these references we are indebted to Eugene M. Nye who is currently completing the manuscript for a book on the life, career and work of Robert Hope-Jones. The author's definition of "formant" is one of perhaps four. Ed.

the voicer must know how to intertwine them, so to speak, with the pure overtones that come from air column (or tongue). A voicer must throw away a pipe when he cannot make its formant "behave," as from improper soldering, and order a new one from the pipe shop. Hope-Jones made thick walls for his Diapason Phonon, Solo Diapason, Horn Diapason, Octave, Orchestral Horn, and all sorts of Tibias. This made the partials of their formants deeper in pitch than from thin walls. Because this made a wider gap in pitches between formant and natural overtones, there was bound to be less beating, hence stronger and purer tone from the pipe. He also mechanically stabilized these stops, making the individual harmonics seem to disappear (or soften), which resulted in a big, warm, pervading timbre. Many of his thick-walled flues and reeds remained in-tune for years.

Because he used high wind pressure he had to raise the cut-up of mouths on most flues. One of his Diapasons heard by this writer had mouths as high as their widths. He also leathered some lips, which reduced the snarling "edge-tones" to a minimum. Some of his leathered pipes still remain and have not deteriorated. In turn, raising cut-ups and leathering, both of which increased fundamental, made the ear less sensitive to the intense pulsing of his high-pressure tremulants. The reader may wonder why all this trouble was taken. If the reader has heard one of his beautiful Horn Diapasons or Diapason Phonons, he will know the answer: the emotional appeal of such a solo stop in melody line cannot be imagined. It must be heard, as say, in a theatre in the 1920's. We must credit Hope-Jones with creating beautiful tonalities the orchestra never had.

Hope-Jones did not invent nicking; it had been known for many decades. He used it to steady the wind-reed that jetted up from the flue to pass closely by the outside edge of the upper lip. It created truer overtones, almost no inharmonics, and made the pipe speak more efficiently and quickly. Thus, his Tibia Clausa spoke almost instantaneously, although it never was unpleasant to the ear. Like the round-timbred Phonon, the Tibia is considered the basic sound of the theatre organ, but mostly in melody line. Without nicking, he could not have created his fabulous Viol sound. He made both the "frying bacon" and silvery types. Each had its place in the music of the day. His Muted Cellos and Muted Viols were also nicked, especially near the centers of languids, where the vacuum pockets and pressure were most intense. Nicking prevents "chiffy" effects, but in "romantic" and theatre organs chiff-tone is in place in all sorts of Orchestral Flutes of 8' and 4' and in Traversos. It gives that accented, "solid platinum" feel to the initial pipe sound, especially with a staccato touch.

Hope-Jones and his crew discovered many secrets of voicing, but, unlike George A. Audsley, they did not write books that revealed them. If he had lived long enough he might have done so because he was highly verbal when lecturing on his new stops. One secret he knew was that a harmonic bridge decreases the dissonant effect of a pipe's vibrating wall especially if on high wind pressure and of large scale. This was his secret in making velvety, round-toned Solo Diapasons, Phonons, Muted Cellos, and beautiful slotted Octaves at 4'. He also knew that bridges of wider diameter increase fundamental ground-tone and decrease "highs." But in his Solo Violin in the Granada Theatre in West Seattle, Washington, Wurlitzer used small, round brass bridges to build up the "highs," increasing brilliance. This results in the opposite of the muted effect.

As his chambers fairly swirled with wind currents from pipes' mouths, he placed huge "ears" at sides of mouths, especially in midrange pipes of smaller scale. These kept the cross currents from wind machines and pipes' mouths from disturbing steadiness of tone in other pipes. Some ears were much wider than their pipes, almost making bridges invisible! He also knew how to dimension slots at tops of flue and reed pipes. As organ designer Eugene Nye says, "These make 'dirty' partials, especially in String Celestes, but their beating with regular overtones from mouths gives a surging, irregular beat that seems to be orchestral." Unusual placement of pipes in chambers also gives unusual reflection patterns to sound waves, which, in turn, may also set up some surging and beating. Orchestral imitations must exhibit irregularities, but how can they be given to the Saxophones? Hope-Jones knew how to make certain partials louder by designing pipes of different shapes: he made the 4' partial louder by inverting wood lips in a Melodia, the 8/9' partial louder by slots of moderate width, and the 8/11' and 8/13' partials stronger by tapering Muted Violas and Gemshorns a little more. These all refer to the 8' pitch.

Eugene M. Nye (Taken 1946)

His Second-touch circuits that operated when manual keys were depressed a little harder by about 7 ounces are still well known. They are on many church organs in England, and are the equivalent of additional divisions, such as a second Pedal. Their special stop controls bring on all sorts of soft and loud stops as well as couplers, full organs, and even Percussions. Accompaniments can be played on First-touch, with 4 ounces of pressure, and the solo line on the 7-ounce Second, all on one manual.

We have not yet taken up the true essence of the theatre organ! Unification is a big word and its implications are so vast that to this day they have not been fully explored. But let us describe this radical development in the organ world that so shocked the National Society of Professional Musicians in 1891 when Hope-Jones briefly referred to it in his lecture before them. This lecture was reprinted in *Bombarde* magazine, summer 1965. Builder Dan Barton's article on Hope-Jones' action, same magazine, April 1966, goes into many interesting details. The Rev. Tyler Turner, always fascinated by this genius, has written up his personal life in *The American Organist* magazine, Aug. and Sept. 1939. Unification was covered in this same magazine in several articles in 1930, when such instruments were still

being built. More recently there was the thorough and revealing article by W.S. ("Stu") Green published in the February and April 1970 issues of THEATRE ORGAN, entitled "Unification – What is It?"

Unified organs, excepting the Midmer-Losh in Convention Hall, Atlantic City, have sounded a range of 121 semitones, which excepts the 64' octave of hooded Diaphones in this organ. Unified organs have carried pitches from the bottom of the 32' note of CCCC up to the top of an unbroken manual 1' rank. But manuals have but 61 keys and pedals but 32. Therefore designing for unification consists of selecting certain stop-pitches that will include various parts of this vast gamut of pitches within each stop. For example, a builder decides that an Open Flute of 4' will be more useful than one of 8'. This automatically includes a different span of notes, and makes this stop an octave higher than the 8' when played from the same keys. If we consider all the stop pitches in an organ, it is possible to play a whole series of notes from each manual and pedal key. This is one of the true essences of an organ. Another is that each pipe speaks with its own individual harmonic series, and each pipe might be called an individual instrument. However, in the orchestra a flute, for example, sounds from its air column. All notes in the flute come from but one instrument. The ear does not miss this interesting variation in tonality.

But let us differentiate between "unit" and "Unification." Hope-Jones used the term "unit" when he referred to placing the stops of each family of timbre in its own separate chamber. In effect, Hope-Jones made every manual a Choir, a Great, a Swell, a Solo, and a Bombarde manual. This originally suggested to him that it would be better to enclose Foundation, Flute, String, Reed, and Percussion units in their own separate chambers. Sometimes he also made Stentor, Woodwind, Accompanimental, and Pedal chambers, each with its own swell shoe, perhaps also with tremulant. This was the original "unit organ" concept (not to be confused with unification). All this was possible because Hope-Jones invented his "master swell shoe coupler" and applied it to all divisions of the organ so that volume in all chambers could be controlled with one swell shoe. But the "unit" idea was impractical for theatre organs. Too expensive.

Hope-Jones at 35, Photo was made during his Birkenhead period and is, to the best of our knowledge, seen in this magazine for the first time. It was given to Lee Haggart by Jim Nuttall.

Unification has to do with the availability of a given voice at several pitches and perhaps on all manuals and pedals. Here is an example. If 12 smaller, lightweight pipes are added to the top of the rank of 61 unison 8' pipes, as in the versatile Viola, both 8' and 4' Violas can be drawn together and no tones will be missing in the highest octave. And if 12 longer, heavier pipes are added to the bottom of the rank of 61 unison 8' pipes, a complete Viola at 16' can be made available merely by electrical switching. Thus a Contra Viola 16', unison Viola 8', and Octave Viola 4' can sound simultaneously on any manual or on all manuals, merely by installing a row of 85 Viola pipes that go from notes CCC up to C5 and stop keys to select the desired pitches. Violas at all of these pitches can also be placed on pedals, as well as Violas at 2' and 1', because the shorter compass of 32 notes on the pedalboard permits two higher octave-sounding stop-pitches than on manuals without running out of notes. The same can be done for any other rank in the organ, including Percussions. Ranks of wider pitch range can also include the 32', 2', 1' and 1/2' manuals.

One disadvantage of unification is that any one pipe can receive duplicated "orders" to sound at the same time. This "lost sound" is sometimes noticed in polyphonic and classical music, but rarely in "romantic" or popular music. In any case the melody voice sounds without lost notes. The chief advantage of unification is that it permits a full complement of stops on a 3 or 4-manual organ from fewer pipes. The increased number of stop-controls Hope-Jones needed he arranged in horseshoe tiers above the keys. Hope-Jones did not derive Mixtures or Cornets from Echo Diapasons and Dulcianas, as have a few unit builders since his time. He intended to avoid shrillness, and depended upon

high overtones to give a "more natural brilliance." Audsley also tried to achieve variety and flexability of tone qualities, but he used mostly couplers to bring regular and floating divisions to any manual or pedals. His system transferred all stops drawn, and not just the one or two stops wanted by the player. Audsley used mechanicals such as these couplers:

String to Accompanimental 16'
String to Accompanimental 8'
String to Accompanimental 4'
Solo to Pedal 8'
Solo to Pedal 4'
Pedal to Orchestral 16'
Pedal to Orchestral 8'

Hope-Jones also used couplers on his organs, but they were not always numerous, and his pedal stops could have been more generously provided. Later builders, such as Kimball, Barton, Page, Morton and Moller, used many more stop-controls for a like number of pipes than Hope-Jones, but then more funds were available for organs after World War I. The huge unified Kimball in the Ball Room, Convention Hall, Atlantic City, actually has all of twenty-two 4', six 2', and thirteen 16' stops, including Percussions, on its Orchestral manual (second from bottom). The Hope-Jones system did much to raise center-of-pitches, and thus keep notes clean in the ear. However, our favorite builder avoided use of many 2', 1', and 1/2' octave-sounding stops.

Other advantages of unification are heard in derived mutation stops that do not sound octaves of keys depressed but tend to reinforce harmonics, stops such as the English Diapason Twelfth 2 2/3', a Tibia Larigot 1 1/3', a sombre Viol Quint 5 1/3', or an Echo Diapason Tierce 1 3/5' or 3 1/5'. These were sources of tonal color never heard before. What good are tone colors? The experts say that they help the ear to identify pitches, and therefore harmony.

Some theatre organs even have had the sprightly Xylophone at 16', 8', 4', 2', and 1' pitches, and with both hardwood and brass mallets. Unified stops have actually been made at 32' up to 1/4' pitches, but, of course, larger organs contain more unusual stops than smaller ones.

One of the chief advantages of unification is that it provides several Tibia Clausas (Tibia "Octaves") at 4' on manuals, assuming ranks are on both sides of the proscenium, which gives the stereo effect. These can make the most effective sound in the world of music: the soprano-like tones that float upward into the treble, carrying with them the soothing voice of a singer. Although an 8' Solo Cello can imitate a tenor voice, the Tibias are famous for their suggestion of a woman's tranquilizing song. It was Hope-Jones' genius to imitate the voice as well as the orchestral instruments. Because he used fewer pipes to obtain the same notes as straight organs, these could be spread out more across the front of theatre or auditorium. This made them sound more cleanly and increased stereo-presence. Unification also required fewer supporting structures such as huge wind reservoirs, and fewer divisions. It provided unusual timbres at ends of ranks, such as a cutting but pleasant Contra Salicional 16', the satiny sound of a Silverette 1' (made from a Salicional), and the Orchestral Bassoon at 32' or 16'. The great flexibility of control of individual ranks in the unified organ approaches the individual control that a player has over his instrument. This system has never been equalled by any other in the annals of organ building.

All of these advantages would have been a mockery if Hope-Jones had not fabricated sturdy, carefully-voiced pipes that remained in tune, often for many months, sometimes years. Organ scholar Stuart Kennedy of Calgary has said that perhaps the finest quality of pipework in all the organ's long history was made by Cavaille-Coll and Hope-Jones. Much of both builders' work is still around, here and in Europe. The pipework of Johnson and Skinner is also known for quality, including Reeds. In his younger days Hope-Jones heard and played the instruments of famous builders, but he heard only the beginnings of what we call "smooth English Cathedral sound." He absorbed the ideals of many fine builders, such as Thomas Pendlebury, who placed bridges of exact parabolic shape on his (wood) Strings. Henry Willis I (born 1821) was as much of an idealist as Hope-Jones, and, like Hope-Jones, was talented in both mechanical and artistic fields.

- to be continued -

In the third and final installment, Stevens Irwin discusses Hope-Jones' influence on other organ builders, some very special organ voices (and where they may be heard) and pipe scaling.

Letters to the Editor concerning all aspects of the theatre organ hobby are encouraged. Send them to the editor concerned. Unless it's stated clearly on the letter "not for publication," the editors feel free to reproduce it, in whole or part.

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Gentlemen:

As new members of ATOS, we are most impressed with the great job done by the organization and find your magazine most educational and entertaining.

There is one thing, however, that bothers us – why in the column "For The Records" have you chosen to refer to the electronic organs as "Plug-Ins"? It is not very complimentary to an industry that, thru advertising, seems to support the magazine quite well! After all, for a good many of us, our introduction to organs came thanks to electronics and then grew into an interest in pipes . . . then think for a moment what happens to the pipe organ when the electricity goes off. So, would you please consider a more charitable sub-title for the column?

Sincerely,
Mrs. E. L. Aured

Dear George,

I read THEATRE ORGAN and since like so many thousands of people I am in love with the organ and organ pipes, I cannot resist the temptation to "get into the act", anent, washing of pipe organ pipes and what that does to them.

I was visiting Willis Organ work recently and young Henry Willis was his usual enthusiastic self in showing me around the works when we came to a section of the factory where two men were busy with the suds and the water and the long handle brushes, and "making them like new again."