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Organ, §V: 1450–1800

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V. The organ, 1450–1800

While much research remains to be done for the beginning of this period, especially on developments in German organs of the area Mainz–Nuremberg–Innsbruck–Basle, a provisional historical sketch can be derived from Henri Arnaut's treatise and from certain documents relating to church contracts concerning organs of about 1450. From the 17th century onwards much more complete documentation is available.

1. The treatise of Henri Arnaut de Zwolle.

Although concerned primarily with small organs, Arnaut's treatise (*F-Pn* lat.7295; ed. and facs. in Le Cerf and Labande, B1932) throws much light on the potential which organs were seen to have by 1450. The treatise was written in Dijon between 1436 and 1454, partly by Arnaut, a Dutch polymath at the Burgundian court of Philip the Good, and partly by two other authors or scribes. It reflects a lively cultural exchange between Burgundy, Paris and the Low Countries. Arnaut's remarks are more practical than those of any treatise since the 11th century. His description of an organ pipe is empirical and systematic; details suggest a scale some ten semitones narrower than *Normalmensur* at bass *B* but some seven semitones wider than *Normalmensur* at a hypothetical treble *b*". The mouth width is about a quarter of the circumference ($\frac{2}{7}$ for bigger-toned pipes), the cut-up a quarter of the mouth width; the foot-hole diameter of a quarter of the pipe width was large, though easily reducible. From the measurements it is unclear whether Arnaut was working from two pitches of $a' = c395$ and $a' = c435$ or from a mean *tonus cori* of $a' = c415$. Two portative or positive chests ('*ciste portivorum*') are drawn and described. In one, a single rank of pipes for the compass *b–g* "'*a*"" is arranged 'ad modum mitre episcopalis' (i.e. like a bishop's mitre, tallest pipes in the middle); in the other, a rank for the compass *b–f*"" is arranged in the chromatic manner, tallest to left, shortest to right ('*ciste communis*' or 'the usual chest'). Arnaut also drew the front of a standard larger organ of the Sion type, probably the instrument at Salins (Salin, formerly in Burgundy), whose 4' *Blockwerk* he later specified as *B* (6 ranks)–*f*" (21 ranks).

On f.127 of Arnaut's manuscript occurs the first incontrovertible reference in organ building to reed stops. On a page of scarcely 20 words (and ten figures) apropos the 'scales ... of the pipes in the church of the Dei custodientes' occurs the phrase 'l'anche de F', which apparently refers to the reed and block of a reed pipe. Arnaut seems to be saying that a rank of such pipes from *B* to *b*' needs eight different sizes of block but gives no other details.

Of the organ of about 1350 in Notre Dame, Dijon, Arnaut noted that the pipes (*B–a*" are already old and corroded; the pipe mouths were generally about half an octave too narrow, in his opinion. The Furniture is mentioned, apparently the only separable part of the *plenum*. The total number of pipes in the organ was 768; the leather bellows (?c1350, ?c1440) had three folds and measured c160 cm by c70 cm. Arnaut also gave in tabular form the disposition of four different *Blockwerke*, one of *F* (8 ranks)–*e*"" (21 ranks), two of *B*–*f*" (6 to 21 and 6 to 15 ranks respectively)

and one of *B'*(10 ranks)–*a'b'*(26 ranks). The first has three categories (Principal, Cymbale, Fourniture), suggesting 'stops' made to play separately by two manuals or perhaps by some mechanical device (possibly a divided chest operated by a *Sperrventil*). The Principal 8' has four ranks at the top and the Fourniture 14 (making 8.8.8.5½.5½.4.4.4.4.4.4.4.4); the Cymbale is nothing less than a three-rank *Terzzimbel*, indeed the first documented mixture containing a Tierce rank. The Cymbale repeats (i.e. breaks back to lower pitches), 29.31.33 at *B*, 8.10.15 at *e*''.

One of the other three organs was apparently that at Salins, which had a long-compass 4' *Blockwerk* of: [not available online] Even more important, perhaps, is that Arnaut's Fourniture is not an accumulative *Blockwerk* but a Mixture that breaks back to lower pitches in the upper octaves.

Arnaut referred also to the 12 'fistula[e] tenoris' at St Cyr (probably Nevers Cathedral), i.e. 12 Trompes or bass pipes, half as long again as the lowest ranks of the chorus. Unlike the other Principal pipes, these pipes had no accompanying Fourniture pipes of their own, and were thus presumably played from a separate keyboard and chests. At the church of the Cordeliers (?Dijon), the ten 'subdupla tenoris' pipes had a separate keyboard which could couple with that of the chorus, thus affording three effects: the usual chorus, the chorus + *tenor* or Bourdon pipes, or *tenor* pipes played by the left hand while the right hand played the chorus or *discantus*. It is unclear what Arnaut meant by 'double Principals' ('duplicia principalia'); did this mean that only the 8' stop was doubled (two open ranks, or one open and one stopped rank), or that all ranks of the principal chorus were doubled? The reference to 'double principals' in the 1519 contract at All Hallows, Barking-by-the-Tower, London, is similarly obscure, although the recent discovery of two early 16th-century English soundboard fragments (analysed in *BicknellH*), strongly suggests the latter. If this is so, then 'Principal' in this context simply meant chorus or *plenum* – a hold-over from the earlier period when it referred to the *Blockwerk* (as at St Sebaldus, Nuremberg) – but with the exception of the 'bassys or diapasons' (corresponding to Arnaut's *tenor*, or the Flemish Trompes). The 'simplicia principalia' of the Dijon court chapel organ was described by Arnaut as 'in duo divisa', which may mean either one halved rank (with treble and bass stops) or the usual paired Principals separated off, perhaps by a slider. Two quints and an octave gave the organ a total of five registers, possibly with five push–pull slider-ends.

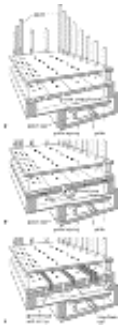
Further light is thrown on Chair organs ('tergali positivo'). Arnaut described one with 195 pipes, *FG–f'* at 4' pitch and a four- to seven-rank *Blockwerk* of octave ranks only. The front pipes were of tin, the others of lead; the measurements of neither the mouths nor the foot-holes were systematic or regular in the particular Chair organ Arnaut was referring to, and he was puzzled as to why it nevertheless sounded well.

Though never completed, and although it appears to be more indebted to earlier writings than was previously thought, Arnaut's draft treatise stands as something unique in organ building, not least in its description of certain *Blockwerk* or *plein jeu* choruses. During the whole of the next century no source was to describe in such detail how an organ builder could plan his chorus. Contemporary documents, like modern histories, prefer to dwell on the new colour stops and other, essentially secondary, effects.

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2. Developments, 1450–1500.

Not only do Arnaut's remarks give a partial picture of the organ at this period, but contracts and other documents from other areas of Europe give corroborating details. Thus the organ at St Sebaldus, Nuremberg (by Heinrich Traxdorf, 1440–41), had Principal, Fourniture and Cymbale, perhaps of the type described by Arnaut. Such a division of the chorus became a kind of norm, not only at Nuremberg but also at the Florinskirche, Coblenz (1467), St Georges, Haguenau (1491), Weimar (1492), St Peter, Basle (1496), Leuven (1522) and in organs farther west. Yet it seems that the instrument of 1474–83 in S Petronio, Bologna, already had a large-scale, 50-note complement of nine single-rank stops (smaller in all respects than the organ as it now is), thus presenting a quite different tradition of organ building in the south.



Medieval and Renaissance chests: (a) medieval block-chest; (b) ?late 15th-century...

Clearly the crucial questions are: how were stops separated, giving the organ different colours or effects, and why did builders of some areas give an organ several manuals while those in others concentrated on one manual? As to the second question, it can only be conjectured that southern builders learnt earlier than northern how to obtain musical variety from an organ with one keyboard, separate ranks and a long compass (e.g. the 53 or 54 notes at S Martino, Lucca, in 1473); and that northern builders, requiring only a few different effects (Diapasons alone, or the *plenum*), found that two or even three shorter or unequal keyboards with one or two registrations each were more useful and probably more powerful.

Division of an organ into several chests was practical from the point of view of wind supply. As to the first question of how stops were separated, the situation is clearer. Several documents from the mid-15th century onwards refer to the varieties of sound achieved by a particular organ: Arnaut used 'registra'; references in church archives include 'registros' (Treviso, 1436), 'tirans' (Aragon, 1420; Barcelona, 1480), 'division de veus' (Perpignan, 1516), 'dreen gelueden' ('three sounds', Grote Kerk, Zwolle, 1447) and even 'a la moderna cum registri sei' ('with six stops in the modern manner', Catarro, 1488). How were these varieties achieved? 'Registers' and 'tirants' (even five 'registres sive tirans' at Avignon in 1539) certainly suggest slider-chests (see [fig.3b](#)). After all, the Roman organ of Aquincum had latitudinal sliders, and its keys admitted wind to the pipes by these means. Longitudinal sliders running the whole length of a rank of pipes were different only in application, not in principle. However, when and where stop-sliders were first made is not known; no doubt they first appeared on small organs. A further system, the spring-chest (see [fig.3c](#)), was reintroduced in the Netherlands about 1520 to give greater reliability in larger organs, but was already known in Italy during the previous century: Orvieto Cathedral is said to have had an organ in 1480 with two spring-stops and two slider-stops. The most common 15th-century arrangement, particularly in the area from Rouen to Zwolle, was the 'double chest', useful especially for Chair organs. In such a chest the channels were divided into two parts, front (case pipes) and back (Mixture or Hintersatz), each with its wind box, the back one of which was provided with a shut-off valve allowing the Mixture to be taken off. Evidence for such chests is fairly clear from several Dutch contracts of the period (Zwolle, 1447; The Hague, 1487).

Much less clear is the origin of stopped pipes, although it is thought that the 'double Principal' of late 15th-century organs could imply an inner rank of stopped pipes sounding with the open case pipes, as well as multiple doubled ranks. 'Coppel' was a name used at first probably for case pipes (Limburg, 1471), later for stopped unison pipes (Bienne, Switzerland, 1517). Much the same may be said about the term 'Flotwerck' (Bassevelde, 1481). The 'lead pipes' for inner ranks referred to in contracts of many languages and areas have also often been assumed to be stopped pipes, but both documentary evidence and surviving Gothic pipework suggest that in many organs all interior pipework, including open pipes, was of lead. The Quintadena is a stopped metal rank sometimes referred to as *Schallpfeifen* early in the next century; it is possible that the emphasis on new organ colours at this later period was responsible for stopped pipes in general. Thus the stopped wooden Holpyp is authenticated from about 1500, but hardly before. Schlick (B1511) was still ambiguous about stopped pipes; even Flute stops at that period (e.g. Bordeaux, 1510) were open, as indeed they remained in Italian organs of a later century.

To sum up, in 1500 the average organ in northern Italy or southern France could be expected to have a chorus of ten or so separate stops, probably achieved with a spring-chest if the organ was somewhat large, with sliders if smaller; the upper ranks may have been duplicated here and there. Spain, at least in cities influenced by Flemish or 'German' builders (Barcelona, Valencia), followed more the transalpine organ. The bigger instruments of the Netherlands and Rhineland had two or even three manual departments, in most cases each with its own keyboard but all at the same (or octave) pitch. The English organ, judging by the All Hallows document of 1519–20 (see §8 below), was of the smaller Flemish kind: although it is possible that in secular or aristocratic circles Italian organs were known, all evidence points to the major influence in England being Flemish.

Some examples of organ schemes at their best before the turn of the century are shown in [Tables 1, 2 and 3](#). That such schemes were distinctly regional can be seen in a 1000-pipe instrument

built by the German Bernhard Dilmanno at Milan in 1464–6, probably a large northern organ of Principal, Mixture, Zimbel etc. The instrument was updated in 1487 but still had only eight separate stop-levers in 1508. However, it is not known how many ranks of a native Italian organ of 1475 would be separate (as in later Italian organs). As to the sound of such organs, only conjectures can be made, even when much of the original material still exists, as it does at S Petronio, Bologna (conservatively restored in 1982). Although some contracts make it clear that specific sweetness or strength of tone was often required, much – perhaps too much – can be read into the use of words like ‘lieblich’ or ‘süss’ in early documentation.

TABLE 1

Mantua (St. Andrea, 1475)	
Mantua (St. Andrea, 1475 (rebuild))	
Great work: Diapason of 25 keys (FGA-g ² a ²), 16 th rank (1460)	
about 6 to 32 total (750 pipes)	
Hauptwerk: Double chest of 25 keys (fg ² a ²), with two 'trasonal', no 4th (2-rank Principal, 4 or 8) and positive (Mantua)	

TABLE 2

Bologna (St. Petronio, 1475)	
F. Korb, 1499	
Manual	
'Schlick Stimm' (3-rank Principal F, F, 14)	
'Mia work' (Mantua)	
'Mia zimmer' (Zimbel)	
Pedal	
'Schlick' (2-rank Principal or perhaps 'three with two stops')	
Pedal	
'Stimm' (Principal)	
'Mia work' (Principal octave above)	
'Zimmer' (Zimbel)	

TABLE 3

Italy (St. Giovanni, Padua)			
Lombard J of Salzburg, 1499			
One manual of 25 keys (FGA-g ² a ²)			
Tenors	5	Decorations	20
Organs	4	Vogelmassework	3
Decorations	2	Flute	8

Barbara Owen, Peter Williams

3. Arnolt Schlick’s ‘Spiegel der Orgelmacher’.

Against the background of the special effects demanded of new organs and promised to their clients by the builders, for example the Schwegel, Waldhorn, Quintadena (*Scheelpipen*), Trumpets, Shawms, Zinks, Rauschpipe, Drums and ‘other unusual stops’ promised by Hans Suys at Antwerp Cathedral in 1509, Arnolt Schlick wrote a splendid, forthright little book on organs, publishing it in 1511 under imperial auspices and indeed apparently intending it as a kind of standard code of practice for organ builders in Maximilian’s empire. Schlick lived in the central Palatinate court town of Heidelberg, and no doubt his influence was wide. The organ described in his *Spiegel* contained about 15 stops, ‘not too many of the same type’, as shown in [Table 4](#). Schlick said that, in addition, the *Hauptwerk* might contain a Krummhorn and the pedal a Klein Octaff and Zymmel, but that the latter two do not belong there. All stops should be playable separately so that the pedal if required could take the cantus firmus. The Hintersatz should not contain the very low ranks of the ‘large Mixture’ (by which he may have meant the old *Blockwerk*), nor the ‘low-pitched’ 3rds and 5ths’ sometimes met with. There is little point in making separate 5¹/₃’ stops, while the addition of various little chests such as *Brustwerke* merely increases cost and produces ‘much sauce for little fish’. Reeds are not unreliable if properly made, and Schlick thought a competent organist could soon learn how to make the necessary minor adjustments to them. Stop-levers (preferably not push-pull) should be conveniently placed, not too long or too heavy to work from the keyboards.

TABLE 4

Hauptwerk	
1. Schlick (2) or more with Principal	
2. Schlick (1) or more with Hauptwerk, or Hauptwerk (1) or more with Hauptwerk	
3. Hauptwerk (1) or more with Hauptwerk (1) or more with Hauptwerk	
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Thus Schlick knew an organ of Principals, Mixtures, flutes and reeds; two manuals and pedal; probably a manual coupler; different open metal pipe scalings (circumference to length 1:5, 1:6 or 1:7); and conical metal pipes, but not, evidently, stopped pipes or wooden ones. He recommended a compass of $F-a''$ and a pitch level about a tone lower than that of today (his $a' = c374-92$, depending on the diameter of the pipe). The pipe metal was pure (or mostly pure) tin and the Principal was doubled (two open metal ranks of different scale). While recommending an irregular tuning with an $A\flat$ that could also serve (if ornamented) as $G\sharp$ in a cadence on A, Schlick recognized that some preferred a regular mean-tone temperament (with major 3rds slightly larger than pure), but saw little use for split sharps as a means of dealing with problems of temperament.

Some of Schlick's general attitudes to organs are informative. He felt that eight or nine stops in the Great were all that were needed; they should be clearly different in tone; and the second manual was to be regarded as a kind of small positive, in no sense a match for the Great. The organ was used in connection with the liturgy, he observed; the priest at the altar was given notes for most mass movements from the Gloria onwards. And since the organ had a particular part to play in such music as sequences, it was placed near the choir for convenience. The pedal may have been transmitted from the Great; certainly it should have stops of the same pitch as the main manual. The pedal must have separable stops like the Great; it should not be made up only of suboctave stops, as it then inverts the harmony. (This must presumably be a double reference to organs with extra large pedal pipes always sounded by the pedal keyboard, and to the practice, then probably rather new, of using the pedals to play inner tenor or cantus firmus lines.) Reed stops can be made well (some are mentioned that sounded new though nine years old). As to Mixtures, neither those consisting of 5ths and octaves nor those of 3rds and 5ths should contain low-pitched ranks. The full chorus should be able to play chords (that is, the 5th ranks in Mixtures should not produce too dissonant a sound when the 5th C–G or the 3rd C–E is played); at the same time, the precise number of ranks in a Mixture depends on the size of the church. Manual keys should not be too long or short, too wide or narrow, nor spaced too far or too near; the given measurements suggest relatively stubby keys with an octave span about the same as on modern instruments.

Some of Schlick's own music in *Tabulaturen etlicher Lobgesang* (1512) is contrapuntal in a way that closely anticipates later organ chorales which use the theme imitatively in three or four parts; in such pieces the pedal took the tune when it appeared in the bass. Schlick also knew pedal playing in two, three and even four parts, as well as pedal runs; for none of these functions would the old Trompes have been useful. The inner-voice cantus firmus technique, however, apparently requiring pedals for music from the Buxheim Organbook onwards, should not necessarily be taken at face value: such organ 'scores' must often have been open to various interpretations or playing methods, and what appear to be third-staff pedal parts in the Buxheim Organbook may (at least in some instances) simply be an easy way of avoiding part-crossing problems.

The largest chapters of the *Spiegel* are concerned with tuning (see [TEMPERAMENTS, §3](#)), the making of chests, and the bellows. Schlick's advice is always very practical; for example, the wind must be generous (presumably for homophonic textures on full organ), the organ constantly played (even during Advent and Lent), and only the best and most experienced builders trusted. The little book thus surveys the whole field of organ activity – building, playing, composing – and even the long chapters on chests and tuning are full of good, pithy advice. For its size and single purpose, the *Spiegel* has never been bettered.

Barbara Owen, Peter Williams

4. The new potential of the 16th century.

Soon after 1500 organs could produce a greater variety of colour and tonal effects than ever before because they had separate stops or several keyboards, or both. Many new stops (above all flutes and reeds) were invented, and one or two extant documents of the period indicate how they were used. About 1510 in both the Rhineland (Worms) and southern France (Bordeaux), such documents contained advice (perhaps from the builder) about registration. *Plena* were mentioned, of course, but more interesting in view of Baroque registration were the two- or three-

stop combinations; the list in [Table 5](#) can be inferred from the *instruction pour le jeu d'orgue* appended to the contract for an organ built by Loys Gaudet for St Michel, Bordeaux. This organ was a southern-style instrument of nine separate single-rank stops, and within a small spectrum such ranks would yield many combinations. More instructive still are the German registrations (St Andreas, Worms; [Table 6](#)), since they concern an organ with pedal and multi-rank stops. Schlick too wanted stops drawn in different combinations, and registrations changed.

TABLE 5

1611	1618-1619
1611	1618-1619
1618-1619	na

TABLE 6

Germany (St Andreas, Worms)	
c1510	
Principals 4' or 2' alone	
Habiliter 4' + Principal 4' or Habiller 4'	
Principal 4' + 2'	
Principal 4' + Habiller 4'	
Habiller 4' + 4' + Quarte 2F	
Regal 4' + Habiller 4' + Quarte 2F make an imitation Zink	
Regal 4' + Habiller 4' make an imitation Krummhorn	
Zinkel line with the new Habilliers	
Manual and Pedal mixtures only in the previous	
Draw stop lead outside the key of C	
Tremulant not to be used with the Regal	
Tremulant not to be used alone 'on account of the force of the wind'	

Particularly important in the documents concerning such new organs as that of Daniel Van der Distelen in Antwerp Cathedral (1505) was the implied distribution of sounds into distinct groups: principals, flutes, reeds and mixtures. From then on, such families were to be paramount. Single-rank mutations, whether scaled as principals or flutes, belonged more to southern organs at that period; but at Antwerp there were at least four reeds, all for specific colour imitations (Cornett, Bagpipe-Regal, Trumpet and Krummhorn/Dulzian). Such imitations became so important during the 16th century that both reed pipes and combinations of flue stops were used to give the desired effects; often it is not clear from a document which of the two a certain Zink, Cornet, Nachthorn or Rauschpipe was. Trumpets and Krummhorns, however, were always imitated by reed stops. It is also unclear from the documents of about 1510 whether the many kinds of flute pipes mentioned were open or stopped. In most cases it could well be that they were open and that stopped pipes were reserved for special colour stops like the Quintadena or perhaps for the second ranks backing the Open Diapasons of the case front. In 1518 Sager promised in his contract with St Mary Magdalene, Basle, that 'the stopped pipes shall be bold and sweet [*tapferer und liblich*] so that they are not too puerile [*nit zu kindlich*] but audible throughout the church'.

During the period from 1500 to 1550 Flemish, north German, north French and Spanish organs had much in common. The Netherlanders in particular developed a mature organ of archaic features, described in Vente's *Die Brabanter Orgel* (D(xxi)1958). In 1510, however, the organ of the Upper Rhineland may have been the most advanced of Europe, having (in addition to principal and mixture stops) wide flutes, narrow stopped pipes, several reeds and smaller *Brustwerk* chests as at Bozen (1495). As so often, very little real connection between this type of organ and the music supposedly written for it can be demonstrated; it is even difficult to understand the relation between Schlick's own music and the organ he prescribed. The connections seen by many modern writers between a south German organ of about 1520 and the group of south German tablature sources of the same period are only speculative. In fact there was in about 1510 so much international activity between builders that national types are difficult to distinguish. Flemish builders in particular could be found working throughout Europe during the 16th century.

The early 16th-century organ was full of colour: manual reeds, regals in the Positive departments (*Rückpositiv*, *Brustwerk*), pedal reeds; Gedackt, Quintadena, Rohrflöte stops (Alkmaar, Laurenskerk, small organ, 1511); Gemshorn and Hohflöte; Siffelöte, Schwegel 1½' and other flute mutations. The last are very significant, often uncertain in documents but usually associated with some special colour effect and even special etymology ('Nasard', 'Larigo'). Tremulants, toy stops (drums, bird calls, bells) and moving statuary were known by the end of the 15th century. The structural developments were very important, particularly the Netherlands builders' division of the Great organ into two departments (each often with its own manual): Principal chorus and trumpets on the **HAUPTWERK**, or main manual, and flutes, Gedackts and mutations on the **OBERWERK**, or upper chest. This separation ensured good wind supply, greater freedom of registration, safer chest construction and better acoustical dispersal from shallower cases. The *Oberwerk* was to influence, even create, the special potential in the next century of the north German **WERKPRINZIP** organ, in which each 'department', or *Werk* (i.e. a keyboard with its chest or chests), had a separate structure. Some examples typifying the schemes of about 1550 at their best, organs to which the previous developments were leading, are given in [Tables 7, 8, 9](#) and [10](#).

TABLE 7

For information about the instrument, see the original manuscript, which is in the collection of the University of Oxford.

Part	Material	Quantity	Notes
Case	Wood	1	
Front panel	Wood	1	
Back panel	Wood	1	
Diapason	Iron	1	
Key frame	Wood	1	
Key levers	Wood	1	
Key flippers	Wood	1	
Woods	Wood	1	
Pipe	Wood	1	
Flue	Wood	1	
Wedge	Wood	1	
Wool	Wool	1	
Leather	Leather	1	
String	String	1	
Knobs	Knobs	1	
Wheels	Wheels	1	
Stops	Stops	1	
Trunk	Trunk	1	
Case	Wood	1	
Front panel	Wood	1	
Back panel	Wood	1	
Diapason	Iron	1	
Key frame	Wood	1	
Key levers	Wood	1	
Key flippers	Wood	1	
Woods	Wood	1	
Pipe	Wood	1	
Flue	Wood	1	
Wedge	Wood	1	
Wool	Wool	1	
Leather	Leather	1	
String	String	1	
Knobs	Knobs	1	
Wheels	Wheels	1	
Stops	Stops	1	
Trunk	Trunk	1	
Case	Wood	1	
Front panel	Wood	1	
Back panel	Wood	1	
Diapason	Iron	1	
Key frame	Wood	1	
Key levers	Wood	1	
Key flippers	Wood	1	
Woods	Wood	1	
Pipe	Wood	1	
Flue	Wood	1	
Wedge	Wood	1	
Wool	Wool	1	
Leather	Leather	1	
String	String	1	
Knobs	Knobs	1	
Wheels	Wheels	1	
Stops	Stops	1	
Trunk	Trunk	1	

TABLE 8

General Europe (Halbwerke, blockwork)

Case, 1535–41

Material	Quantity	Notes
Front panel	1	Partially missing
Back panel	1	
Diapason	1	
Key frame	1	
Key levers	1	
Key flippers	1	
Woods	1	
Pipe	1	
Flue	1	
Wedge	1	
Wool	1	
Leather	1	
String	1	
Knobs	1	
Wheels	1	
Stops	1	
Trunk	1	

Foot:

(including second row of pipes in Hauptwerk case; 3 1/2 inches)

Some or right halves in original organ.

Back of a 441.

Blockwork case under organ and suspended action flaps hanging from trunks.

Construction and details in organ pipes played.

Blockwork caseboard organ (Hauptwerk case)

TABLE 9

Ialy (5 Gesengen, Brescia)

Case, 1581

Case material (CDPFGK-g/a), 13 units

Front panel	1	Partially missing
Back panel	1	
Diapason	1	
Key frame	1	
Key levers	1	
Key flippers	1	
Woods	1	
Pipe	1	
Flue	1	
Wedge	1	
Wool	1	
Leather	1	
String	1	
Knobs	1	
Wheels	1	
Stops	1	
Trunk	1	

Foot: full length, original compass structure.

Originally spring-case.

Wood pattern in C case.

Part above our instrument above a 441.

TABLE 10

Case in discussion in terms of case

Case, 1581

Material	Quantity	Notes
Front panel	1	Partially missing
Back panel	1	
Diapason	1	
Key frame	1	
Key levers	1	
Key flippers	1	
Woods	1	
Pipe	1	
Flue	1	
Wedge	1	
Wool	1	
Leather	1	
String	1	
Knobs	1	
Wheels	1	
Stops	1	
Trunk	1	

Case in discussion in terms of case.

Foot: full length, original compass structure.

Originally spring-case.

Wood pattern in C case.

Part above our instrument above a 441.

In the Iberian Peninsula, organs were generally built by Italians (e.g. Évora Cathedral, 1562) or Netherlanders (El Escorial, c1580); there were scarcely distinct Iberian characteristics. Yet Évora had more Mixtures than an Italian organ, and El Escorial had its secondary manual in the form of an internal Positive (*Cadireta interior*) rather than a Dutch-Flemish *Rückpositiv*. In England organs appear to have remained single-manual instruments until the late 16th or early 17th century, although some of these, particularly in large monastic foundations, may have reached a fairly good size before the Reformation. While early 17th-century English organs had the southern characteristic of single, individually available ranks at unison and quint pitches, early 16th-century organs were more Flemish in style and appear to have had the partly divided *Blockwerk* scheme of north-west continental organs of about 1500. Wooden pipes, and even organs with wooden pipes only, were known in the 16th century, but there is no evidence of reed pipes having been incorporated into large church organs until the late 17th century, although small regals containing both reed (short-length) and flue pipes were much in evidence and are described in some detail in an inventory of Henry VIII's household furnishings (see §8 below). Early in the 16th century the English organ acquired a slightly larger key compass than the organs of northern Europe, a characteristic maintained into the 18th century. The double organ with Great and Chair (*Rückpositiv*) division is documented from the beginning of the 17th century, and inspired the writing of a type of voluntary in which solo passages were played by the left hand on the Great against an accompaniment on the Chair, both hands usually going to the Great in the final section – the so-called 'double voluntary'.

As the 16th-century Italian organs in Innsbruck and Brescia still exist, various subjective

descriptions of their tone have been made. At Brescia (see [Table 9](#)) the average to narrow scalings (apparently untransposed) and the low pressure give a mild tone, round, rich and singing. Low pressure may also explain the absence of reed stops in such organs, or vice versa. The downward compass of Italian organs varied with the size of the church: the larger the church, the lower the compass. The top note was almost always *a*², the bottom *c*, *G* or *F* (positives), *C*, *G*, *F* or even *C*' (full-size organs). The 15th-century organ at S Petronio, Bologna, went to *F*' or *G*' at 16' pitch (i.e. into the 32' octave). When pedal-boards were added later to such organs, they were thought of as mechanical conveniences for pulling down the bass keys; pedal parts (beyond pedal points and cadential chord roots) do not appear in Italian or Iberian music until the 19th century. As for the pipework, only open metal pipes were included. The ranks of the separated high stops break back no higher than the pipe sounding *c*⁴^{####}; that is the top treble of the compass has an accumulation of ranks usually no higher than *Principale 2'*, resulting in a kind of circumscribed, if fully divided, *Blockwerk*. The lower ranks are sometimes divided between *b* and *c*'. Musically, such organs had a distinct function and character. Costanzo Antegnati's rules for registration (1608) show timbre, musical style and liturgical function to have been intimately connected; for example, the *ripieno* or *tutti* was drawn for sustained music of the *durezza e ligature* style, which was itself applied to such pieces as toccatas at the end of the 'Deo gratias'. Flute stops of all pitches were *da concerto* (i.e. 'for solo use'), not for accompanying motets or filling out the ripieno. The undulating Fiffaro (or Voce umana), a principal-toned rank, was drawn with the *Principale* alone and played slow music 'as smoothly and legato as possible', often with melodic snatches in the right hand (as in Frescobaldi's toccatas), and is frequently recommended for playing in the Elevation. Some useful combinations were those shown in [Table 11](#). At the same time, as Diruta showed, some keys (i.e. ecclesiastical tones) were associated with particular moods and hence particular registrations. He recommended 16' with Flauto 8' for the mournfulness of E minor (Phrygian); but for D minor (Dorian, full and grave) he added as alternative suggestions 16.8 and 16.16. For F major (Lydian, moderately gay) he recommended 8.4 with Flauto 4; but for G major (Mixolydian, mild and lively), 8.4.2. Equally important is that three is the largest number of stops drawn in many such lists of registrations, apart from the various big *ripieni* used only once or twice in a service. It is never certain how far or wide such rules apply, but much Italian music of about 1620 can be seen in terms of the older Antegnati organ, more modest though the organs of Rome, Naples and elsewhere seem to have been. The greatest developments in Italian organ building between 1475 and 1575 were rather in the design of the cases (Gothic to Renaissance) than in the technical or musical sphere, where there is an unusual conformity.

TABLE 11

Organo 8' + Flauto 8', good for quick passages and concertos
Principale + Flauto in diadecima, good for quick passages and concertos
Principale + Flauto in quattordicesima, good for quick passages
Ped. 16', good for occasional long note in a recital
Organo 16.8.4.2.1.1
Mixolydian 8.4.1.1 with Flauto in octava
or 8.4 with Flauto in octava
or 8.4 with Flauto in diadecima
Use both stops per for dialogue?

The 1551–61 Ebert organ at Innsbruck (see [Table 8](#) and fig.29 [not available online]) is very strong in tone, neither manual proving useful for accompanying a choir. The cases are shallow (*Rückpositiv* less than 50 cm), the chests spacious, the organs contained in resonant wooden boxes. Since all the Chair organ (*Rückpositiv*) stops have close equivalents in the Great organ (*Hauptwerk*), yet at only 4' pitch (as so often during the 16th century and the late 15th), the two manuals can be regarded partly as extensions of each other in different directions. Indeed, the Innsbruck organ puts in a new light the perennial question of the purpose of second manuals (a question rarely admitting of any obvious answer, despite common assumptions). The stopped pipes at Innsbruck are very strong in tone, with a big mouth and a tone-colour ranging from wide, vague flute sound in the bass to strong, breathy treble colour. The two Hörnli stops are very keen, repeating Terzzimbeln. Throughout the organ there is a distinct change of tone-quality from bass to treble, enabling the *Hauptwerk* bass keys to produce a different quality of sound from right-hand solo lines in the treble.

The organ of the Oude Kerk, Amsterdam (see [Table 7](#)) was that known to Sweelinck and shows the 'Brabant organ' at its most characteristic: big *Principale* chorus, large flute stops on an *Oberwerk* chest, smaller stops but yet greater variety in the *Rückpositiv*, and the pedals playing the *Hauptwerk* chorus for *plenum* registrations and also having a pair of high-pitched, strong-toned solo stops for (presumably) cantus firmus music. The sheer variety in the manuals would alone have encouraged variations on psalm tunes and folk melodies over the next century or so,

even had there been no tradition for weekday organ recitals occasioned by the prohibition of the use of the organ in the Reformed liturgy until after the middle of the 17th century. From surviving examples of Niehoff pipework, it seems that the inner parts were of thick, hammered lead of good quality; the principals were narrow in the bass, wider in the treble; and the whole had a mild-voiced, singing quality quite different from the organ of the later Baroque period. Flutes were wide to very wide; reeds penetrating, particularly in the bass. The spring-chests were considered an advance on the slider-chests already known for smaller organs (Alkmaar small organ, extant slider-chest of 1511) or for the Chair organs of larger instruments; and in some areas (north Italy, Westphalia) spring-chests of different types remained popular for well-spaced, large-scaled organs after they had fallen out of fashion in the north. The Amsterdam organ was evidently of a very high class, and its concept and musical repertory were known in Brabant, the Netherlands, Cologne, Würzburg, Lüneburg and much further east. Some examples had big Pedal divisions, resulting during the period 1575–1600 in an organ type known from Groningen to Danzig, Frederiksborg to Prague, and passed on by a group of composers directly or indirectly under Sweelinck's influence.

The musical position of the 1580 Barbier organ at Gisors (see [Table 10](#)) is less certain, as indeed is that of all French organs before about 1660. The French organ of 1520–75 often had a wide array of colour, whether of the Bordeaux-Italian type in the south, or the southern Flemish variety of reeds and compound stops in the north. Reeds of 16', 8' and 4' could be expected in a larger organ of about 1575; so could one or more Quint mutations; 8', 4' and possibly 16' ranks of stopped (often wooden) pipes; a few 'obsolescent' stops like the 1' Principal; and even a mounted Cornet, often called 'Flemish horn' (see [ORGAN STOP](#), under 'Cornet'). In many respects the Gisors organ was Flemish: the *Positiv* construction (in French instruments the Chair organ had become temporarily uncommon), the spring-chests, the *CD-c'''* compass, the Quint flutes of 1½', the 8' pedal stops, and the *grand ravalement* for the pedal reed. In sound, no doubt the instrument was nearer to the Netherlands organs of Niehoff than to the late classical French organs of F.-H. Clicquot.

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5. Structural developments c1600.

From the many enormous and apparently amorphous organ specifications given by Praetorius it could be reasonably thought that many central German builders of the late 16th century did not have clear control of the organs that their technology enabled them to build. The number of stops and stop types listed by Praetorius is evidence of his attempt to give order to a somewhat embarrassing luxury of choice. The number of 4' solo Flutes alone, for instance – narrow, wide, open, stopped, chimney, spindle, narrow-stopped, narrow-conical and overblowing–narrow-stopped – contrasts strongly with the 17th- and 18th-century systematized French organ of average size, where there was probably only one plain Bourdon 8' or Flûte 4', and that with a very specific function. Some of the biggest organs, such as those in Prague and Danzig, are scarcely credible: the Týn Church in Prague appears to have had a four-manual, 70-stop organ built between 1556 and 1588, but it is possible that it was a conglomerate instrument, finished in part, but perhaps never all playable or ready at once.

More important was the potential opened up by new mechanical skill in disposing multiple chests – giving the Pedal, for example, a pair of back or side chests for the large pipes, using front chests for middle Principals and a *Brustwerk* chest or two for smaller-scaled solo stops. Each pedal key then connected with two or even three pallets. The first such 'multiple action' may have been built earlier in the century in the central Netherlands (Antwerp Cathedral, 1505; St Zwysen, Diest, 1523), but the evidence is inconclusive. By the end of the century extravagant court chapel organs were built with some of the richest mechanical layouts ever known before pneumatic action, allowing an immense array of stop combinations. If the simple organ of 1563 for the Dresden court chapel allowed 77 manual combinations with its 13 stops and Tremulant, as stated in a contemporary document, then hundreds were no doubt possible on the famous Groningen court chapel organ of 1592–6 ([Table 12](#)). Whether there was enough fish for all this sauce might have been doubted by Schlick.

Clearly the Groningen organ offered many colourful effects, particularly those of two or three stops only; indeed, the number of stops normally drawn at once by organists of that time cannot be assumed from modern practices. With the exception of three Principal choruses of four or five stops, the registrations at Dresden (referred to above) were all of three stops or less. Quite apart from what this fact might imply about the state of contemporary wind-raising techniques, it suggests that organs of the period were geared towards subtle colour and musical variety. As to the 'multiple chests' themselves, a very plausible attempt to describe their complex action, double pallets, transmission and extension system has been made by Bunjes (D(xv)1966). The most useful arrangement was the most traditional and long-lived, namely the multiple pedal division in which the biggest bass pipes would take one or two chests, and the cantus firmus and other high stops another chest. Wind could be prevented by a *Sperrventil* from entering any chest not immediately needed; and a low pressure could be better sustained if no chest was above a certain size.

A circumspect reading of Praetorius reveals three main types of complex layout, two of them multiple action: (i) the double action enabling two or more chests to be played by one keyboard (e.g. *Brustwerk* and *Oberwerk* from *Oberwerk* keys only); (ii) the transmission chest (with two pallets), enabling one or more ranks of pipes to be played by two keyboards (usually the bigger stops of the *Oberwerk* played by pedal keys); (iii) octave and even quint transmission or 'extension', that is, a chest construction enabling a rank of pipes to be played at unison, quint or octave pitches. The third was very rare, but important in view of later developments. Since couplers were also much to the fore in organs using complex action, and since the *Sperrventil* increased the registration possibilities (by making drawn stops inoperative until required), it can be seen that an important musical aim was maximum variety for a given number of ranks. But such aids had the potentially bad effect of overemphasizing the main *Oberwerk* chest to the detriment of true secondary manuals, weakening the independence of the pedal, and encouraging the cultivation of intricate workmanship as an end in itself. But the Chair organ remained an independent department in the major organs, and as such helped to provide the right conditions for most idiomatic organ music of 17th-century Germany, as it also did in France, the Netherlands, Scandinavia and England.

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6. The Werkprinzip organ.

The Chair organ was indeed the manual that supplied the true balanced chorus to the Great; but in areas or periods in which second manuals were required for simple echo effects or soft background colours (Spain and Italy during the whole period, France during the 16th century, England after 1700) or in smaller churches where expense had to be avoided, the Chair organ was dispensed with and smaller chests were incorporated in the main case.

The visual characteristics of the **WERKPRINZIP** organ (the term is a modern one, coined by the 20th-century reformers) – the single main case, the Chair organ, the separate pedal towers – were all known by the 15th century. But by the time of Praetorius, owing to the range of available organ colour and the widespread mechanical skill in making good actions, builders were able to develop a type of instrument using such features put to new, unified purpose. Scheidt's remarks in his *Tabulatura nova* (1624) imply a sophisticated and codified practice for organs and their music, and show the instrument to have developed well along the lines laid down by Schlick and beyond recognition of those laid down by Arnaut. Indeed, it is a mistake to relate the *Werkprinzip*

Chair organ and (even more so) its pedal towers to the organ of Arnaut's period. It is often very uncertain whether in about 1450 the Chair organ of a large instrument had the same pitch as the Great or its keys aligned with it; nor was two-manual playing necessarily known outside Schlick's area and period. Similarly, although side towers or *trompes* held bass pipes, they were not necessarily played by pedal keys; in any case, a vital function of *Werkprinzip* pedal towers is that they hold cantus firmus solo stops near the Protestant congregation in or below the gallery. No doubt the larger instruments of about 1550 might have had pedal towers combining both characteristics; but the *Werkprinzip* organ flourished many hundreds of kilometres north-east of the areas knowing the old *trompes*, and did not become fully developed until after the Reformation.

One of the attractions of the *Werkprinzip* was that an organ could be altered and its potential enlarged simply by adding a new department to the old. While the Totentanz organ of the Marienkirche, Lübeck (destroyed in 1942), is much less understood than modern references to it suggest, it is certain that its four departments expressed the ideals of four quite different periods: the *Hauptwerk*, the late 15th century; the *Rückpositiv*, the mid-16th century; the *Brustwerk*, the early 17th; and the completed Pedal organ, the early 18th. Many famous organs of this type in northern Europe (e.g. Jakobikirche, Lübeck; Johanniskirche, Lüneburg) are in fact composite instruments (quite apart from modern rebuilds), accumulations of *Werke* constantly altered in compass, specification, tuning and no doubt voicing by builder after builder. The smaller Jakobikirche organ, restored in the 1980s to the form given it in 1636 by Stellwagen, still contains part of its late 15th-century Principal chorus, the pipes made of nearly pure lead. The big organs of the Niehoffs, the Scherers, and the Compenius and Fritzsche families were like living organisms; except for the large chamber organ in the chapel of Frederiksborg Castle, Denmark, none remains in anything like its original state.

Organ historians are often tempted to trace the organ's evolution in terms of the best-known builders. Frequently, however, contributions are attributed to a builder on the basis of mere conjecture or even fable. Probably not a single item in the list of innovations commonly attributed to Gottfried Fritzsche, for instance, is specifically his: inclusion of a fourth manual; more systematic use of 32' and 16' reeds to written C; introduction to north Germany of rare stops, both flue (Viol, Schwegel, imitative flutes) and reed (Sordun, Ranket); contrast between narrow 'male' and wide 'female' stops (e.g. Nasat 2 $\frac{2}{3}$ ' and Quinte 2 $\frac{2}{3}$ ' on the same manual); reduction of the big Brabant Scharf Mixture to a high repeating two-rank Zimbel; greater use of tin in the pipe metal, and also of wooden pipes (reeds, flues, stopped, open); and systematic adherence to C

compass, sometimes with split keys ($d^{\#}/e^b$ etc.). But they certainly belong to his period. Such a list, taken with the provincialisms running through Praetorius's *Syntagma musicum*, ii (2/1619), does lead to a distinct kind of organ. The chief musical characteristics of the *Werkprinzip* thus emerging in a purer form in the north were: the contrast between a full, round *Hauptwerk* and a thin, piercing, more variable *Rückpositiv*; the versatile pedal; and the clarity of the whole in average parish churches with little reverberation. In most cases it was the *Rückpositiv* that was understood to be the 'solo manual', and as such it performed an important function in the chorale-based literature of the 17th century. The idiom was clearly defined for organists, who seem to have been in little need of registration hints either from composers or from builders. (Balanced contrast could easily be achieved between two manuals if the same number of stops was drawn in each.) Explicit and firm registration rules have been formulated only in areas and at periods in which organs were more uniform (e.g. in northern Italy c1600, France c1700 and England c1750).

The Hamburg *Werkprinzip* organ reached maturity and indeed satiation in the work of Arp Schnitger, famous in his day far and wide, the possessor of many privileges, and, with Gottfried Silbermann (whose organs were quite different in many ways), the inspiration for the German Organ Reform (*Orgelbewegung*) of the 1920s. Despite work in progress, surprisingly little is certain about Schnitger – how responsible he was for his individual instruments (his workshop was large and active), what his scaling policy was (scales vary hugely, depending on the church, the pitch, the value of the old pipework he re-used, etc.), what his pitch and temperament were, why he usually changed small multifold bellows to large single-fold bellows in his rebuilds, why he dropped the *Rückpositiv* in his late work around Berlin, who designed his cases. Research has established that his wind pressures varied between about 94 mm or higher (the large organs in Hamburg) and about 67 mm, an average being about 85 mm (Nikolaikirche, Flensburg). [Table 13](#) gives the stop list of his first four-manual organ, in the Nikolaikirche, Hamburg (destroyed in

1842). Such very large organs give a kind of highest common factor of instruments known to such composers as Buxtehude, Lübeck and Bruhns and on which toccatas and chorales of the older composers (Scheidemann, Weckmann, Tunder and others) were still played. In some areas of the Netherlands, north Germany and Scandinavia, such an organ remained the model until 1850 or so, and the *Werkprinzip* can be recognized behind later organs very different in sound and appearance from the Hamburg Nikolaikirche.

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7. The French classical organ.

In northern Italy the 'classical Brescian organ' of the late 16th century remained a norm to which the occasional 17th-century two-manual organ was an exception (and probably built by a foreign builder); it was only in the mid-17th century that the French organ achieved its classical form, intimately bound up with music of a distinct and well-characterized idiom. The very number of *livres d'orgue* published following the publication of the *Caeremoniale parisiense* (1662; see [ORGAN MASS](#)) suggests a remarkably unified 'organ school'. Every stop in a French organ of about 1700 came to have an appointed purpose, and the *livres d'orgue* from Nivers (1665) to Marchand (c1715) and beyond, several of which contain registration tables, give the impression that late 17th-century Paris had shaken off outside influences past and present.

But Flemish influence had originally been paramount in northern France as Italian and Spanish had been in parts of southern France. Titelouze's *plenum* was much the same as that of a Dutch composer. Even the Cornet was Netherlandish, from the time of the organ in Antwerp (1565) onwards. Yet while many details in Mersenne's *Harmonie universelle* (1636–7) may point to northern influences like Praetorius, important moves towards the organ of the *livres d'orgue* were made at this period, above all in Paris. Narrow- and wide-scaled Tierces soon became common (narrow at St Nicolas-des-Champs, 1618; wide at St Jacques-de-la-Boucherie, 1631) and with them a general change towards mutation colour (e.g. more $1\frac{3}{5}$ ' ranks, fewer 1'). Mersenne knew Tierces as ranks used both in the *plein jeu* and for solo combinations. More important still were the new short-compass keyboards of solo or quasi-solo character: the 25-note Cornet manual (i.e. a *Récit*) at St Séverin, Paris (1610), set a new fashion, though intended at first only as a little keyboard giving the raised Cornet chest a second row of keys. Were the little extra chest to be placed below the *Grand orgue* it would be called *Echo* and probably have a shorter keyboard and more ranks. By 1660 a large organ could be expected to have four manuals (including two treble halves): two supplying classical Great–Chair organ contrast (*Grand orgue* and *Positiv*) and two right-hand solo manuals (*Echo* and *Récit*) for music influenced by the monodic *récit dramatique* of the *ballet de cour*.

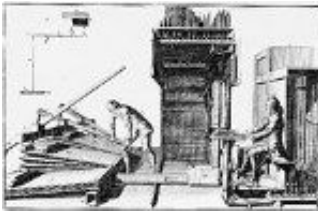
C= 12, 16, 22, 28, 32
F= 8, 12, 16, 22
G= 1, 5, 8, 12, 16

The organ played by Nicolas Lebègue ([Table 14](#)), one of the organists to Louis XIV, shows the French scheme of the period at its best. Rarely can an organ have been so closely related to the music

of its period as such an instrument to the works of Lebègue, Raison, Grigny, Couperin and others. Standardization was one of the chief aims. To obtain the **PLEIN JEU** for those movements in the Mass that required it, for example, the organist drew the Principals 16', 8', 4', 2', then added the Fourniture, whose composition was probably something like: and then finally the Cymbale: which, if it was a large four-rank Cymbale, included the 26th as well. Such schemes were recorded by Bédos de Celles (B1766–78) at the end of the great period but can be taken as typical; thus, for instance, his specification of 1766 (for the case design, see [fig.30](#)) is almost

indistinguishable from that of the 1674 organ at Le Petit Andely. Important points about the French chorus (which also, through his brother Johann Andreas in Alsace, influenced Gottfried Silbermann in Saxony) are that the Cymbale broke back more often than the Fourniture but generally duplicated the Fourniture in the treble; no rank is higher than 2' at c''' (i.e. 28 mm long); and doubled ranks did not occur in either Mixture. The *plein jeu* was rarely brilliant, never shrill; it was rather a further 'colour' of the organ.

TABLE 11 St Louis des Français, Paris Alexander Thierry, 1670/72		
Grand orgue	Positif	Pédale
Orgue		
Musique	16	8
Bourdon	16	8
Musique	8	4
Bourdon	8	4
Trompette	4	2
Clarin	4	2
Rue	4	2
Flûte	4	2
Musique	2	1
Bourdon	2	1
Musique	1	
Bourdon	1	
Clarin		
Bourdon	8	4
Clarin	8	4
Musique	8	4
Bourdon	8	4
Musique	4	2
Bourdon	4	2
Musique	4	2
Bourdon	4	2
Musique	2	1
Bourdon	2	1
Musique	2	1
Bourdon	2	1



Cross-section through an 18th-century French organ, showing among other details...

Pitch, at least from about 1680, was about a semitone below $a' = 440$. Pipe metal was hammered, including the lead pipes for flute stops. The keyboards were always pivoted at the end, and the mechanism suspended from the chests above, trackers passing straight from the *Grand orgue* keyboard to the pallet box ranged vertically above the keys (fig.31). The *Positif* stickers connect with a lever which raises the pallet placed above the channel-end. Such systems were simple and logical, providing the player with a very sensitive action facilitating, among other things, the playing of

ornaments.

To obtain the **GRAND JEU**, the organist drew a varying combination of reeds, Cornet, Principals 8' and 4' and Tierces, but no mixtures. The reeds supplied volume and brilliance; the Cornet boosted the thin reed trebles; the Tierces encouraged the overtone level that gave prominence; and the Principal 4' strengthened the basic tone. Fugues were often played on such registrations, and other fugal colours, such as Tierce combinations with Tremulant, give an impression quite different from that of Italian or German fugues of the period 1650–1750. On larger organs, a pair of Trompettes on the *Grand orgue* after about 1750 gave a timbre peculiar to the bass depth and brilliance of French reeds. Late in the period a Trompette was also put on the *Positif*, and following the organ at Notre Dame, Paris (Thierry, 1730–33), *Bombarde* manuals were also very occasionally included – keyboards coupled to the *Grand orgue* and playing the large-scaled *Bombarde* 16', perhaps with other large reeds; at Notre Dame the *Bombarde* division could also be played from the Pedal. The chief purpose of this was to give the ranks their own chest and wind supply, which was often experimentally high by the end of the classical period. Similarly, it was the treble 'boosting' supplied by the Cornet that led eventually to higher pressures and double-length harmonic resonators during the next century. The reed basses, however, remained the chief glory, encouraging composers to write special *basse de trompette* music from about 1650 onwards. *De grosse taille* ('of large scale') is a phrase often applied in 17th-century contracts to the Trompette.

Even in *plein jeu* registrations (in which the mixtures replaced the reeds for brilliance), the French organ was not overdrawn. Only a handful of stops was involved in any of the characteristic French registrations, and all the codified ingenuity was geared towards clearly marked colours. Thus the texture of a piece marked *Tierce en taille*, one of the most beautiful effects known to organists, would consist of the following elements: (i) left hand on *Positif*, Bourdon 8' + Prestant 4' + Doublette 2' + Nasard + Tierce (perhaps + Larigot), playing a free, singing melody in the middle of the texture, gamba-like; (ii) right hand on *Grand orgue*, Bourdons 16' + 8' + 4' (*jeux doux*), playing accompaniment above or around the melody, and (iii) pedal playing the bass line on a Flûte 8' (or perhaps coupled to *Grand orgue* Bourdon 16' in later examples). There was some variety in such registrations: Bédos de Celles, for instance, did not like 16' manual stops in accompaniments. On the other hand, the Tierces were so characteristic of French organs that many combinations were possible: a right-hand Cornet line on the *Grand orgue*, for instance, could be accompanied in dialogue by a left hand *Jeu de tierce* registration on the *Positif*. From D'Anglebert (1689) onwards, Quatuors and Trios had been played using three different colours including pedal: indeed, the chief purpose of the pedal was 'pour pouvoir jouer les trios' (according to Joyeuse's

contract at Auch in 1688) and to play 8' and 16' cantus firmus in pieces built on a plainchant. The biggest drain on wind supply and narrow channels must have been the slower, sustained music written for *concert de flûtes* and *fonds d'orgue* registrations, comprising all available Montres, Prestants, open Flûtes and Bourdons. Such sounds became fashionable around the middle of the 18th century; but whatever the combination, no organist in the provinces need have been in doubt about how the Parisian composers expected their pieces to sound.

The splendid French organ at the eve of the Revolution (1789) may well have been far superior to the music written for it, as were the Dutch organ of 1700 and the English organ of 1850; but it is the very decadence of the music that best draws out the extravagant contrasts, brilliant reeds, round flutes, echoes, big choruses and immense colour potential available on such extant late instruments as those at St Maximin-en-Var (J.-E. Isnard, 1773) and Poitiers Cathedral (F.-H. Clicquot, 1787–90). The French organ received a serious setback when the Revolution disrupted life in the cities. It was ripe for development at the very moment when Clicquot's sons became soldiers; but not until Cavallé-Coll's organ for St Denis, completed in 1841, did Poitiers have a worthy successor.

Barbara Owen, Peter Williams

8. The English organ.

Evidence for the late medieval organ in the British Isles is extremely sketchy, partly because of the protracted period of religious and political instability that lasted from the Dissolution of the Monasteries in 1536 until the Glorious Revolution of 1688, which wiped out a huge mass of material, and partly because the small instruments that were characteristic of this period warranted little in the way of extravagant description or fame. There is some evidence of connections with the European mainland. Despite Henry VIII's leanings towards Italian culture, those connections (at least in organ building) seem to exist in greatest number and importance with Flanders. Most significant were the appearances in England of Flemish organ builders such as Michiel Langhedul at Salisbury Cathedral in 1530 and Jasper Blancart in London (1566–82), both from families of craftsmen well known on the Continent.

The nature of the organs associated with the great age of Tudor church music remained completely obscure until the late 20th century, when a number of significant finds were made. There may have been isolated large organs in Britain, such as the one built by Laurence Playssher for Exeter Cathedral in 1513 (for which bills survive), but all the remaining evidence suggests that the standard instrument used to accompany the choral liturgy was small. This evidence consists of large numbers of inventory records made after the Dissolution, a couple of early contracts, and, since 1995, two fragmentary remains of early 16th-century instruments preserved by chance. The most important of these, the 'Wetheringsett fragment' (an entire organ soundboard of about 1520 preserved as a door in a farm building in Suffolk fig.32 [not available online]), indicates the type of instrument typical of the school ([Table 15](#)), its size and scope directly confirmed by contemporary contracts at All Hallows, Barking-by-the-Tower, London (Antony Duddyngton, 1519–20), and Holy Trinity, Coventry (John Howe and John Clynmowe, 1526). In large buildings instruments of this type seem usually to have been multiplied in number, but not in size. At Durham Cathedral before the Dissolution, according to one account, there were five organs in various parts of the building, of which at least one had pipes of wood, each with its specific role in the liturgy and in the cycle of the church year. The largest instruments of this period may have been based on a full-compass Diapason of 10' pitch, though the Principal 5' was still regarded as the unison. The use of a long chromatic keyboard is characteristic of English instruments; the provision of the low accidentals, at a time when mean-tone tuning was probably universal, may be explained by the English love of ornamentation in keyboard music.

TABLE 15

Wolverhampton Organ
 Aston, c1520 (based within 5 years either way by surviving during war)
 Speculative reconstruction of original stoplist from evidence of
 pitch, notes, stops and pipe holes

One manual of 46 notes, C-c², fully chromatic

Diapason (open wood)	10 (lowest 17 notes only)
Principal	5
Principal	5
Claron, open wood	5
Oboe	21
Oboe	21
Superoctave	11
Superoctave	11

Compass of pipes F-c² (i.e. transposing up a 4th)
 The pitch standard of five feet, referring to the dead-end length
 of the pipe hole, gives an F (played by keyboard C) roughly
 equivalent to G or G[♯] at modern pitch of a' = 440

From around 1570 there is widespread evidence from all parts of the British Isles that, as a result of Puritan opposition, organs were removed and destroyed. With the revival of a High Church party in the early 17th century, led by William Laud, organs were returned to the cathedrals and collegiate churches, but not, it seems, to the parishes. The great majority of these new instruments, like the Worcester Cathedral organ of 1613 (Table 16), were built by members of the DALLAM family. Many were 'double organs', i.e. of two manuals, for which the genre of organ music that became known as 'double VOLUNTARY' was developed.

TABLE 16

Worcester Cathedral
 Thomas Dallam 1613, for the organist Thomas Tomkins, situated
 on the choir screen

Great Organ		Choir organ	
Open Diapason	10	Diapason (stopped wood)	10
Open Diapason	20	Principal	5
Principal	5	Flute (wood)	5
Principal	5	Small Principal or Fifteenth	21
Recorder (stopped)	5	Two and Twentieth	21
Tenth	21		
Small Principal or Fifteenth	21		
Small Principal or Fifteenth	21		

Key-compass: C-c², fully chromatic, 53 notes
 Compass of pipes F-c² (i.e. transposing up a 4th)

The Civil War of 1642 onwards brought an end to this activity, and organs across the land were again dismantled. The Catholic Dallam family sought refuge in Brittany, where they continued to ply their trade, adapting completely to the local style. After the Restoration in 1660, organs were restored or newly built at first on exactly the same pattern as before the war. However, new foreign influences soon promoted the arrival of a new style, and a further wave of rebuilding and new commissions. The post-Restoration English organ was partly the result of rivalry between two organ-building factions. In the aftermath of the Fire of London in 1666 the city was opened to all craftsmen in order to speed the rebuilding. One who came was Bernard Smith (c1630–1708), an organ builder then resident in the Netherlands (although probably German in origin), later to become known in affectionate recognition as 'Father' Smith. He established himself and gained a royal connection in the early 1670s, much to the chagrin of his rivals, the remaining members of the Dallam family and their in-laws the Harrises. Smith and Renatus Harris (c1652–1724) made a public exhibition of their rivalry in 1683–8, both building new organs for the Temple Church in London, a contest that became known as the 'Battle of the Organs'. Smith's instrument (Table 17) was judged the better; Harris's organ was removed.

TABLE 17

Temple Church, London
 Bernard Smith, 1683

Great Organ

Diapason	10 (C-c ²)
Diapason (stopped wood)	10
Principal	5
Principal	5
Oboe	21
Recorder	5
Flute	5
Small Principal or Fifteenth	21
Two and Twentieth	21
Tenth	21
Open 16' (c ²)	21

(Note: organ stopped) (lowest 10 notes low, see notes mentioned in the Great Organ)

Recorder (stopped)	5
Flute (wood)	5
Flute (wood)	5
Oboe	21
Small Principal or Fifteenth	21
Two and Twentieth	21
Tenth	21

Choir organ (small) situated behind the Great organ, behind the choir screen

Diapason (stopped)	10
Diapason (stopped)	10
Principal	5
Principal	5
Small Principal or Fifteenth	21
Two and Twentieth	21
Tenth	21

Key-compass: C-c², with extra line a 4th above the normal for 16' and 18' (c²) compasses
 Compass of pipes c-c² (i.e. no transposition)

Smith went on to build the organ for Wren's new St Paul's Cathedral, completed in 1697. This also had three manuals, the Great organ descending to low C', 16' pitch. Pull-down pedals to the Great organ were added in 1720. The split keys, used by Smith at the Temple and at Durham Cathedral (1686), allowed for some remoter keys to be used without any compromise to the mean-tone tuning.

Despite Smith's success, Harris was ultimately just as busy. His own instruments (e.g. that for St Bride's, Fleet Street; Table 18) showed some influence from the Dallam-Harris clan's period of

exile in France, and, given the continental background of these rival builders, the question might be asked as to why they did not introduce the conventional European C-compass or even independent Pedal organs. In fact Smith was working in the Netherlands at a time when the independent Pedal was only just becoming a feature of the largest new organs, and the depth of Harris's debt to France was surely tempered by the fact that he was only eight years old when the family returned to England in 1660.

TABLE 19

St Paul's Church, River Street, London
Renatus Harris, 1712

Great organ	Choir organ
16	16
16	16

In the end it was the Harris style that succeeded into the 18th century, through the work of Renatus's son John Harris and associated craftsmen such as Richard Bridge and John Byfield (i) and (ii). The standard three-manual instrument of the period, with its long-compass Great organ and (now) Choir organ (disposed as a Chair in some cathedral and collegiate instruments, but otherwise normally placed behind the Great), was enlivened by the conversion of the old short-compass Echo (where the pipes were entombed in a box of some kind) into an expressive Swell organ by fitting a movable front (operated by a pedal at the console) on to the box enclosing the pipes. The first example of this was introduced by the two Abraham Jordans, father and son, in their instrument at St Magnus the Martyr, London Bridge, in 1712 (and may have been derived by them from earlier Iberian examples). Even the most fully developed large instruments followed this established pattern, simply supplying stops of familiar name and type in more extravagant numbers. In the instruments of Bridge (Table 19 and fig.33 [not available online]) and the Byfields a superficial resemblance to the French type remains, right down to the occasional use of wide principal scales for the mutation stops. However, it is clear that English national taste exercised itself vigorously in excluding any blatant sounds or gross pitches, the emphasis being rather on sweetness, delicacy, and the accuracy of the imitative registers (Trumpet, Hautboy, French Horn, Bassoon, Vox humana and Flute). The extempore players of the 18th century, performing voluntaries perhaps slightly more complex than those which survive in printed form for the large semi-amateur market, would have exploited these imitative effects to the full. The Swell divisions, originally fitted with sliding sash fronts, but by 1800 with 'Venetian' shutters after the pattern of the familiar window blind, enhanced the expressivity of these effects.

TABLE 20

St Paul's Church, River Street, London
Renatus Harris, 1712

Great organ	Choir organ
16	16
16	16

Registration followed conventional patterns. Solo stops (the reeds, Cornet and Flute) might be heard on their own. Otherwise the combinations referred to most frequently are 'Diapasons' (Open Diapason plus Stopped Diapason, used for slow introductory movements) and 'Full Organ' (all Great organ stops except the Cornet). The latter combination would be given an agreeable nasal twang by the Trumpets and Clarions, and by the provision of third-sounding Tierce ranks in the mixtures in addition to the usual unisons and Quints. During the 18th century organs such as this became universal in cathedrals, collegiate churches, and the parish churches of wealthier towns. In the cathedrals and colleges they accompanied the choir; in the parish churches they accompanied the congregation in singing metrical versions of the psalms and were used for extempore voluntaries before, during and after the service.

The market for new organs in the 18th century was vigorous and competitive, encouraging

indigenous and immigrant craftsmen, including the Swiss-born John Snetzler (1710–85), who settled in London around 1740 and adapted completely to the local style. Considerable demand was also developing for small instruments for secular use. There had been a tradition of chamber organs in England since early times (see [CHAMBER ORGAN](#) and [POSITIVE](#)), and several examples of small organs, often with pipes entirely of wood, survive from the second half of the 17th century. There was a considerable revival of interest in the second half of the 18th century contemporary with (and perhaps because of) the great popularity of Handel, who seems regularly to have used small or even portable organs when playing continuo and for the performance of organ concertos as interludes to larger works.

Later 18th-century builders, notably members of the England family and Samuel Green, continued to refine the basic recipe, adding only the Dulciana (a delicate string-toned stop first used in Britain by Snetzler) to the range of available voices, and never exceeding the size of instrument established by their immediate forebears. The only expansion in range came in the occasional provision of pull-down pedals to the Great organ, in larger and later examples operating a single rank of unison Pedal pipes also.

The national taste for subtlety and delicacy meant that English organs gradually became softer and prettier in sound as the century progressed. The importance of the art of voicing had been demonstrated by the rivalry of Smith and Harris. The Englands and Samuel Green became obsessed with tonal beauty. When Green built a new organ for Salisbury Cathedral in 1792 ([Table 20](#)), the building was closed to visitors for two weeks so that he could attend to the tuning and voicing in near silence. Green also provided an organ for the Handel Commemoration festival of 1784, an enormous event held at the west end of Westminster Abbey. Hoping to address such new demands, Green's successors attempted to build much larger organs in the years immediately following 1800, but still adhered to the insular recipe of the English classical organ type, until at last abandoning it in the 1840s in favour of the 'German system' of uniform C-compass keyboards and independent pedal organ.

TABLE 20	
Salisbury Cathedral	
Samuel Green, 1792	
Great organ	18
Great Organ	18
Great Organ	18

Stephen Bicknell

9. The Baroque organ in the Iberian Peninsula and Latin America.

The organ of the Iberian peninsula has many special characteristics. Yet Baroque organs of Spain and Portugal differ in detail from area to area, and while the visual parts of such instruments were indigenous and individual, their musical characteristics are founded in common European traditions. In 1500 Spanish organs stood at much the same point as those of northern France, the Netherlands and northern Germany, having separable stops of varying colours and pitches, though being more likely to have but a single keyboard. The influences were Flemish rather than Italian – a Pedro Flamench ('Peter the Fleming') was at work in Barcelona in 1540 – and even the term 'Fleutes' for Principals (a later term was Flautado) was Flemish. Principals and Mixtures (Mixtura, Forniment, Simbalet) were the stop-changes or *mutaciones* available on the new big organs of 1550, as they had been earlier in the north, although positives were already showing an array of slider-stops, including regals, reeds and wooden flues. Evidently Flemish builders brought Chimney Flutes and Quintadenas with them, and by the 1550s new large organs of splendid proportions could be expected to have large-scaled reed stops. Often these reeds had colourful names: Trompetas naturales a la tudesca ('German or Dutch

trumpet stops with natural-length resonators'), Clarins de mar ('trumpets of the sea', as used for naval signals) or Clarins de galera, molt sonoroses ('gallery trumpets, very sonorous') at Lérida in 1554. Although none of these was horizontal, the terms are evocative and probably played their part in the later evolution of the remarkable Iberian reed stops.

Just as Flemish singers were called to Felipe II's court chapel in Madrid, so Flemish organ builders were commissioned (notably members of the Brebos family), putting into practice their up-to-date ideas at El Escorial. The Brebos organ had a large *Hoofdwerk* of two chests and big flue and reed choruses, as well as flute mutations; the pedal was similarly a large modern department. But the only other manual was a *Brustwerk* (though one of 12 stops), and indeed Chair organs were never to become important in Spanish organ building, although the *Cadireta* (both interior and exterior) was later to become a common secondary division. Barcelona seems to have been a centre for northern European builders, but registrations left at the monastery of Sant Joan de les Abadesses in 1613 show the stops to have been used in a traditional or old-fashioned way, and during the 17th century emphasis shifted south and west.

Organ with reeds placed horizontally in the convent of S... Regals may have been the first reed stops to be placed horizontally in Iberian organs (in the manner later known by the French term **EN CHAMADE**), but in 1659 the builder Echevarría placed a full-length Trumpet (Clarín) horizontally in the façade of his organ in Alcalá de Henares, boasting that he was the first to do this. Placing reeds horizontally in the case front was convenient for sound (penetrating in big churches where the organ did not face the congregation), accessibility (for quick tuning), reliability (gathering little dust), economy (replacing cathedral trumpeters) and appearance ([fig.33](#)). But the documents rarely specify whether reeds were horizontal or not, just as documents before the end of the 18th century rarely specify whether or not 'Eco' chests or interior Trumpets and Cornets were placed in a box. Reeds were plentiful: in addition to the Clarins ('mounted like cannons' in the cornice), Echevarría's organ contained Trompetas reales ('of which there can be three kinds'), Dulzainas, Orlos (resembling 'the guitar and harpsichord' (*zitarra y clavicordio*)), Trompeta mayor ('a stop found in few other organs'), Bajoncillos ('also newly invented'), Voz humanas and *Angeles o Serafines* (angel statues blowing trumpets). By 1750 a large organ would have a huge battery of reeds, vertical and horizontal, many kinds of chorus, large Swell departments and even a pedal rank or two. The well-known organ of Granada can be taken as an example; its stop-list is given in [Table 21](#). No large Spanish organ can be called fully 'typical'. As in Italy during the next century, the larger the organ, the greater the variety of solo stops; the large organ of Toledo (1796), however, shows no advance on the concept of smaller organs built nearly a century earlier.

A few registration guides for Spanish Baroque organs have been found. One, for an instrument made at Segovia Cathedral about 1770, suggests the few staple requirements organists made of these extravagant creations. They comprise French-style 'dialogues' (two-part pieces with mutation stops or reeds in each hand), regal solos (e.g. Dulzaina in either hand), half-stops for each hand on the same manual, echo effects and manual contrasts for two- or three-part music, flutes contrasted with reeds (perhaps for use in homophonic music), inner vertical reeds with outer horizontal trumpets, cornets and reeds 8', 4' or 8', 2' combined. Because organs of this period contained many halved stops (*medio registro*), the right hand could produce a line lower than that of the left hand, or one very much higher, and this feature characterizes much of the music of the time. The Echo box is also mentioned, not for swelling but to mute the effect of certain registrations. Pedals are ignored.

Over the whole period, the bellows of the Iberian organ were usually multifold and operated by hand. Wind pressure was low (c50–60 mm), though up to 90 mm on larger instruments. The chests were always slider-chests, usually divided into bass and treble, either between *B* and *C* (usual in the south) or *C* and *C* (usual in the north). As in French organs, the pallets are directly above the keys (suspended action). The chest layout is often very complicated, each group of stops set on channelled-off subsidiary chests, terraced at different heights, easy to tune and reach, and often some way removed from the pallet. Neither bellows nor trunks and channels allow the families of stops to be combined, but the rigidity of registration enabled builders to include helpful accessories like knee-operated 'shifting movements' to aid stop-changes. Secondary divisions are often placed on the floor of the main case (*Cadireta interior*) and operated by a sticker action; if there is a Chair organ (*Cadireta exterior*), the pallets are below and directly in line with the lower keyboard, and the channels pass below the closely placed organist's

seat. A middle manual may operate pallets of a pair of chests placed in the rear case-front of the organ, facing the side aisle. There are no manual couplers. Pedal keys are short, sometimes mushroom-shaped, usually encompassing eight or ten notes, as in Italian organs; there may be a rank of wooden pipes but most pedals are pulldowns, presumably for organ points and cadences. The hinged lid of the Echo box – known to contain a Cornet by about 1675 but including reeds by about 1710 – was raised by a pulley and rope operated by a pedal-lever that needed to be kept down if the lid was to remain open.

The scaling of the Principal is often narrow, the tone restrained; flutes are gentle, and Cornets expansive but thinner than the French. The quiet flutes contrast greatly with the reeds, which were designed to fill the spaces of a large Spanish church outside the immediate intimacy of the quire or *coro* over which the organ looms. Reeds and regals, and divided stops in general, encouraged solo music, and Correa de Arauxo's *Libro de tientos y discursos* (1626) shows a matured technique of left- or right-hand solos, a technique similar in effect to other 17th-century dialogue music such as the English double voluntary and certain French pieces (*Basse de trompette*). The reeds also played chords, not only for the celebrated *batallas* (battle-pieces) but also for imposing intradas on feast days.

At Zaragoza (extant case dated 1443) organs were already placed between the pillars of the quire of the church. It was probably this position that encouraged large flat façades bearing little resemblance to the inner construction of the organ itself, indeed often giving it the appearance of having more chest levels than it has. The amount of empty space within a Spanish organ absorbs strong partials in the *plenum* and helps to produce the mild quality of the flue choruses.

No account of the Iberian type of organ would be complete without some mention of its manifestations in the New World. Imported organs, at first small, are recorded in Mexico not long after the Conquest, before the midpoint of the 16th century; by the end of the 17th century there are numerous records of organs being both built and played by native Mexicans who had been taught by Spanish priests. In 1624 it was recorded that 'no Augustinian church lacked an organ', and that promising youths from each village were being sent to Mexico City at community expense to study music and organ playing. From this period to the late 19th century virtually all organs in Mexico were locally built. One notable exception is the large Epistle organ in Mexico City Cathedral, built in 1693 by Jorge de Sesma of Spain and first used in 1695. Its main manual has over 30 divided stops, with smaller *Cadereta* and *Positivo* divisions playable from the secondary manual. In 1734 José Nassarre, a Mexican who had already constructed a sizable organ in Guadalajara Cathedral, enlarged the *Cadereta*, and the following year he completed an organ of similar size on the Gospel side of the quire, which had an additional 27-note *Recitativo* enclosed in an expression box. Both organs have survived neglect and fire, and were restored in 1978 by the Flentrop firm. Many Mexican builders of the 17th century are anonymous, but in 1738 the first of several generations of Castros established a workshop in Puebla, and significant work of this family survives in the area. In 1786 Manuel Dávila was advertising that he built organs tuned in equal temperament, and in the early 19th century José Antonio Sanchez and Manuel Suárez were active in the Taxco area. Even at the end of the 19th century, Mexican-built organs were conservative in nature, generally following the 18th-century Iberian pattern of a single-manual instrument with treble and bass stops, housed in ornate casework often of considerable artistic distinction. The late 19th and early 20th centuries saw the decline of the Mexican organ-building school and increased importation of German, Italian and, to a lesser extent, American and French instruments. Many native Mexican organs were allowed to go to ruin, but since the restoration of the Mexico City Cathedral organs funds have been made available through the Patrimonio and private foundations to make possible the restoration of a number of significant instruments. Although Mexican organs became well documented and studied in the final decades of the 20th century, little is still known about those elsewhere in Latin America other than that significant numbers of older organs have been reported, especially in Peru.

Barbara Owen, Peter Williams

10. The 18th-century Italian organ.

The essentials of the Brescian classical organ were established by 1575 at the latest: large,

shallow cases (somewhat altar-like in shape, open-spaced above the pipes), with one chest at the level of the case pipes (spring-chest, mortised with well-spaced channels often of equal size), and multifold bellows and low wind pressure. The compass would rise to a'' or c''' , with all but case pipes of metal with a high lead content (thick-walled, principals relatively narrow in the bass, flutes wider with smaller mouths) and completely separate ranks (the upper of which break back an octave at regular intervals). The tuning would be some form of mean-tone temperament, but the general pitch level would vary from organ to organ ('come si vuole', as Antegnati remarked), as indeed it did throughout Europe. Sometimes there was an octave or so of pedal pulldowns (short keys sloping up slightly; 'pedali a leggio'), and occasionally after about 1600 with thin-walled wooden Pedal Principals. Registration was standardized, and each combination suggested to the player a certain modal style to be played at a certain moment of the Mass (e.g. 'Voce umana' for the Elevation), as set forth by Banchieri (*L'organo suonarino*, 1605) and others.

Italian builders and organists remained faithful to these ideas, modifying them gradually but leaving them recognizable even in the large organs of the 1850s. Yet it could be that historians have overemphasized the Brescian organ, for each city or region had its own version of the general plan. The Flemish builder Vincenzo Quemar had already introduced stopped pipes (Flute $2\frac{2}{3}'$), Chimney Flute (2'), conical flute ($1\frac{2}{3}'$), reeds (Tromboni 8') and regals (Voce umana 4') at Orvieto Cathedral by 1600, as well as a Tremulant and an aviary of toy stops. Less than a century later, another German (the Silesian Eugen Casparini) was introducing Mixtures and even Cornets in organs of the Tyrol, as well as confirming the trend towards the German-French $C-c'''$ compass, and the Fleming Willem Hermans had a strong influence in Tuscany. But indirect Italian influences appear to have been strong elsewhere early in the 17th century, notably in Provence and Jesuit Poland (conventual churches). Second manuals remained the exception, and the one made by the Dalmatian builder [PIETRO NACCHINI](#) for S Antonio, Padua, in 1743–9 presented a character little different from that of S Maria in Aracoeli, Rome, in 1587: I Ripieno, Voce umana, two flutes, Tierce, regal; II Ripieno, Voce umana, one flute, Tierce, regal; Pedal 16'. As builders began collecting the upper Ripieno ranks on to one slider, a Mixture resulted that was not so different from a French *Fourniture cymbalisée*. A particular taste grew during the 18th century for Tierce or (as they were called) Cornetto ranks, but these had already been included in some two-manual registrations written down in Rome in 1666. Moreover, during the 18th century large, experimental organs were built on special commission, spreading new ideas from Bergamo to Sicily. Toy stops remained an important element in Italian organs. Although rivalry with the fine organs 'at Marseilles, Trent and Hamburg' may have been the motive behind the five-manual organ at S Stefano dei Cavalieri, Pisa (Azzolino Bernardino Della Ciaia, 1733–7), and elsewhere, the result was peculiarly unlike any of them. The 1730s may have seen a parting of the ways when builders throughout Europe were developing techniques beyond musical requirements; but the five-manual, three-console, 55-stop organ at Catania, Sicily (Duomo del Piano, 1755), though admired and even copied in the next century, was little more than an accumulation of several classical Italian organs, collected together, and it was decidedly atypical. The effect of Spanish rule on the Kingdom of Naples has yet to be explored from the point of view of organ building, but it seems doubtful whether Spanish influences ever went further east than the Balearics.

A characteristic and influential organ type of the later 18th century was the Venetian, brought to fruition by Nacchini and his pupil and successor Gaetano Callido. The Callido firm built hundreds of single-manual organs and many with two manuals (the pipes of the second being enclosed in an expression box from about 1785), all of excellent workmanship and summing up many of the 17th- and 18th-century trends, discarding the more extravagant elements, giving their organs a velvety, vocal tone far removed from Antegnati; indeed, in their wide-scaled Principals they influenced many a so-called *Italienisch Prinzipal* in modern German organs. The stop-list of an instrument by Callido is given in [Table 22](#); for ease of tuning, the regal (Tromboncini) stops were placed in front, standing vertically before the Principale (as they did in other Italian organs of the period). Registrations provided by Callido elsewhere show orchestral imitations to have been important to organists of the period; there is no subtle play of two manuals, and in general swell shutters seem to have been used either quite open or quite closed, rather than expressively.

Research by Umberto Pineschi during the last two decades of the 20th century into the important Tuscan school and the influence of Willem Hermans thereon, together with the work of the state-sponsored restoration workshops at the Palazzo Pitti in Florence, has added to the knowledge of the Italian organ and to the preservation of its heritage.

11. The organ of J.S. Bach.

In many ways the organs of Bach's main area of activity, Thuringia, Weimar and Leipzig, showed the same kind of influences as his music: a basic German traditionalism tempered with French colour and Italian fluency. Neither the organ nor the music was as local in origin or as independent of other regional ideas as was usually the case elsewhere, even in the mid-18th century. Bach himself is known to have been well acquainted with organ music of many countries and periods, as were such contemporaries as J.G. Walther; later colleagues, however, seem in some respects to have had less wide knowledge. C.P.E. Bach's remark that his father registered stops 'in his own manner', 'astounding' other organists, might conceivably refer to either a French or a 17th-century north German approach to stop-combination, one not known to players of the younger generation, who thought that 'the art died with him'; however, one must be careful not to read too much into this remark. On the other hand, J.S. Bach is said to have complained that Gottfried Silbermann's mixtures were 'over-weak', with 'not enough sharp penetration', which might suggest that he did not appreciate that Silbermann's French *plein jeu* was different in function from a north German *organo pleno*, being one of the many colours rather than a total chorus. Moreover, the period in which Bach worked was one of a changing aesthetic for organs, when the large west-end organ became increasingly associated with congregational hymn singing, requiring big chests, large bellows capacity, many 8' stops (including those of string tone), a powerful 16' pedal tone for 'gravity' and a range of sound characterized more by extremes of loud and soft than by a full array of equal, piquant colours.

Apart from the qualities of his music, then, the position of Bach in organ history is important, and can serve to show some of the currents affecting the flow of German organ music. In the course of two centuries, the area between Hanover and Breslau produced great builders (the Fritzsche and Compenius families, Casparini, Silbermann, Joachim Wagner, Engler, Hildebrandt, Trost and Schulze) and some even more influential theorists (Praetorius, Werckmeister, Adlung, Agricola, Marburg, Sorge, Knecht, Seidel and Töpfer). Its composers included many who travelled to hear and see great organ traditions elsewhere (for example Bach, who went to Lübeck to hear Buxtehude and to Hamburg to prove his ability on a Schnitger organ) or who settled down in another part of Germany and formed schools of keyboard playing around them (Froberger, Pachelbel, C.P.E. Bach). Many details of the stop-lists of J.S. Bach's organs at Arnstadt (1703–7), Mühlhausen (1707–8) and Weimar (1708–17) remain unclear, as do larger matters of registration and tonal effect; but fine restorations during the 20th century of organs by Trost and other builders contemporary with Bach, along with the increased accessibility of Thuringia and Saxony since 1989, has helped considerably in the understanding of these matters and in the dispelling of many *Orgelbewegung* misconceptions. The Arnstadt organ ([Table 23](#)) can be taken as typical, one known by the Pachelbel school as well as Bach's family. The particular kind of second manual on this instrument, the pedal department, and the range of 8' manual colours had long been traditional in this part of Germany, and in style the Weimar court chapel organ followed much the same patterns.

Larger church organs began to allow for new attitudes towards the *plenum*. When Bach was a student in Lüneburg in 1700 or visited Lübeck in 1706 organists there would not have 'mixed the families' of organ stops by drawing more than one rank of any given pitch even on the larger organs. As Werckmeister had written in 1698, organists should not draw two stops of the same pitch, because wind-supply and tuning problems would prevent them from being fully in tune together; but by 1721, shortly after Bach's visit to Hamburg, Mattheson was suggesting an *organo pleno* of all stops except reeds – Principals, Bourdons, Salicionals, Flutes, Quintatöne, Octaves, Fifths, Mixtures, Tierce, Sesquialteras etc. The significance of any remark made by Mattheson, or its precise meaning, is often a matter of conjecture, but after the midpoint of the century Adlung and Agricola both seem to have supported the idea of mixed stops. Adlung thought that good modern bellows ought to allow an organist to draw Manual Prinzipal 8' + Gedackt 8' + Gemshorn 8' + Rohrflöte 8' with Pedal Contrabass 32' + Posaune 32' + Sub-Bass 16' + Violon 16' + Posaune 16' + Oktave 8' + Gedackt 8'; and composers such as Gronau drew Prinzipal 8' + Flute 8' + Oktave 4' + Flute 4' + Salicet 4' + Trompete 8' + Oboe 8' to bring out the melody of an organ chorale. Thus,

during Bach's lifetime, ideas about what constituted Full organ were in the process of changing, as were ideas about the number, kind and use of solo stops and combinations, as illustrated in Kauffmann's *Harmonische Seelenlust* of 1733–6.

In Lüneburg, Lübeck and Hamburg Bach would have heard organs with *Rückpositive*, but after about 1710 such divisions were rare in new instruments of his own area and further south; some cities had not known them since about 1650. The *Rückpositiv* at Mühlhausen already had a stop-list (8.8.4.4.2.2.1½.2II.III) quite different from the bright, colourful manual of Dutch and French organs, and, where gallery space was sufficient, builders preferred to hold such second-manual chests within the Great case, usually above the Great. The resulting *Oberwerk* was thus different in origin from that of Niehoff and Schnitger. At the same time pedals became progressively less able to provide solo colour for cantus firmus music, itself a dying genre; and organs took on a stereotyped character that varied only if the builder was sensitive to different voicing and scalings demanded by different church acoustics.

The privileged organ builder to the court of Saxony was Gottfried Silbermann, a native of Saxony who was apprenticed to his elder brother Andreas in Alsace and returned to make the friendship of such composers as Kuhnau and Bach. Silbermann's early organ in Freiberg Cathedral, Lower Saxony (1710–14; now restored), already demonstrated many of these developments (Table 24). Here was not a mass of clumsy auxiliary stops but a unique blend of Saxon and Alsatian-French elements, full of well-thought-out balance between the three manuals, and implying a mode of registration needing to be learnt carefully by the organist. Silbermann's voicing is strong, particularly of the Principals; his smaller village organs have great power and energy. Wind pressure (as in Joachim Wagner's organs) was c94 mm (manuals) and c104 mm (pedals) in later organs, about 10 mm higher than that of good large organs of about 1700.

There is little direct connection between any of Bach's organ music and such instruments as that at Freiberg; but were the Trio Sonatas, for instance, known to the organist of such a church, he may well have drawn for lively movements the combination of stops noted by the local priest as having been recommended for Silbermann's Fraureuth organ (1739–42) for *jeu de tierce en dialogue* (called *Tertien-Zug zweystimmig*): right hand Prinzipal 8' + Rohrflöte 8' + Oktave 4' + Quinte 2½' + Prinzipal 2' + Tierce 1½'; left hand Gedackt 8' + Rohrflöte 4' + Nasard 2½' + Oktave 2' + Quinte 1½' + Siffelöte 1'; and Pedal Sub-Bass 16' + Posaune 16'. Given a free choice, as he may have been in the design for Hildebrandt's large organ at St Wenzel, Naumburg (1743–6; restored in the 1990s), Bach might well have chosen to combine the features of several organ types: three manuals including *Rückpositiv*, 53 stops including Cornet and solo pedal stops, and each manual designed as an entity with its own auxiliary stops (Viola, Fugara, Gamba, Unda maris, Weitpfeife, Spillflöte etc.). As in all organs frequently played by Bach, Naumburg had several string-toned stops, either narrow cylindrical or conical, and various sources, including Bach himself, suggest that they were used not only in chorale preludes, but in continuo work. Tierce ranks, alone or as constituents of the Sesquialtera-Cornet, were indispensable for solo melodic lines in an organ chorale. Manual reeds were never numerous (even at Naumburg they accounted for less than 10% of the manual stops) and were, except Vox humana and Krummhorn, for chorus purposes, although pedal reeds at 16', 8' or both are found even in organs of moderate size. The Mixtures at Naumburg were more in the bright German tradition than Silbermann's *pleins jeux*, and the pedal reeds (32', 16', 8', 4') had something of Silbermann's élan. A contemporary critic of one of Hildebrandt's organs in Dresden thought its tone dull and heavy, owing to increased wind pressure, higher cut-ups, and new voicing methods in general which spoil the Praetorian 'Lieblichkeit der Harmonie'. But such factors were characteristic of the new mode of the 1730s and 1740s in general, and 'gravity' in an organ was praised by Bach and others.

In view of the cross-currents in German organ design from 1700 to 1750, it is not surprising that Bach should have left only a few registrations, and those only of a general nature. The published Schübler chorale preludes (c1746) make it clear whether the pedal is a 16' quasi-continuo bass line or a 4' cantus firmus melody line, but they do not specify colour. The manual Prinzipal 8' and pedal Trompete 8' registered in the autograph manuscript of the *Orgelbüchlein* prelude BWV600 are there as much to indicate that the canonic voices are to sound an octave apart as to suggest actual stops to be drawn. For a concerto or a prelude and fugue it is rarely clear on whose authority the manuals (and particularly the manual changes) have been specified in the manuscript copies. The subject is thus open to many solutions and suggestions. But on no

single organ that Bach is known to have played would all his organ music have sounded at its best or been given a registration suitable to its carefully conceived style and genre.

Barbara Owen, Peter Williams

12. Splendours of Europe, 1650–1800.

Between 1725 and 1750 a large number of important organs were built: the great organs of Haarlem, Gouda, Weingarten, Herzogenburg, Naumburg, Dresden, Breslau, Potsdam, Uppsala, Catania, Pisa, Tours, Paris (Notre Dame), Granada and Braga. All these and many other organs of their type were designed both to fill their churches with big sound and to tickle the ear with delicate effects. Neither purpose was known to the 16th-century builder. The very tendency to build organs exclusively at the west end of the church pinpoints this move towards extremes of sound, for apart from the large conventual churches, and larger French parish churches, the new west-end organ was the only instrument in the building, especially in Protestant countries, where the need for a smaller auxiliary organ in the liturgy had largely disappeared and choirs, if any, occupied the west gallery. The generation of builders who produced the even bigger, later organs of the 18th century (Toledo, Saint-Maximin-la-Sainte-Baume, Hamburg Michaeliskirche, Rostock Marienkirche, Arnhem, Nijmegen, Amorbach, St Florian and Oliwa) or theorists who planned yet bigger ones (Vogt, B1719, and Bédos de Celles, B1766–78) were mostly seeking to exploit the same extremes.

Earlier, however, characteristic national developments had frequently resulted in organs which, though conceived within classical limits and not, as it were, stepping outside idiomatic, traditional usage, nonetheless had greater potential than their composers seem to have been aware of, although improvisation was widely practised, an art of which we have little concrete knowledge in this period. Thus the problem with organs of 1650 to 1750 is to know for certain what they were meant to play and how they were meant to sound, whereas the problem with organs of 1750 to 1850 is that the music for which they were built, often with great ingenuity and unsurpassed technical skill, may be difficult to admire.

Two good examples of the northern organ about 1650 are at Klosterneuburg and Alkmaar; both retain many features of their originals in spite of extensive rebuilding. Much is still unknown, however, of the detail of the originals, and it is necessary to rely on the stop-lists, given in [Table 25](#). At Klosterneuburg neither the *Brustwerk* nor even the *Rückpositiv* competes with the main chest (*Hauptwerk* and Pedal), either in sound or in appearance. The *Hauptwerk* dominates the ensemble, in the true 16th-century tradition of central Europe; perhaps it, not the pedal, was originally meant to take the 16' pipes in the case. The instrument should be seen not so much as a three-manual organ but as a group of three independent organs: *Hauptwerk* for postludes etc., *Rückpositiv* for interludes, solos and major accompaniments, *Brustwerk* for continuo. It is uncertain whether the organ originally had manual reeds, other than the Regal; but mutations are also few, and colours were obtained by a variety of 8' and 4' ranks. 8' colour stops were becoming very popular throughout the area Vienna–Ulm–Prague–Vienna, and on paper the main chests of such organs often appear misleadingly large. 14 out of 28 stops at the Týn Church, Prague (J.H. Mundt, 1671–3), were on the *Hauptwerk*, 16.8.8.8.8.8.4.4.2 $\frac{2}{3}$.2.1 $\frac{1}{3}$.1.VI.IV, but four of the 8' stops were colour changes, not chorus ranks. Salicional 8', Viola 8' and similar stops were characteristic of late 17th-century Habsburg Europe; Salicet 4', Fugara 4' and Dulciana 4' were common by the early 18th century; and reeds, except a pedal rank or two, gradually disappeared. Theorists like the Cistercian writer Vogt (B1719) emphasized 8' colour stops; and for such registration rules as those given by J.B. Samber (*Manuductio ad organum*, i, Salzburg, 1704), the conical Viola 8' was useful in many varied combinations: continuo playing, Viola 8'; fantasias, Viola 8' + Flöte 4'; fugues, Viola 8' + Mixtur III; versets, Viola 8' + Zimbel II.

Soon after the organ at Klosterneuburg, organ cases in the area became divided into a kind of Habsburg equivalent of the *Werkprinzip* design, with one case for the *Hauptwerk*, one for the Pedal and one for an Echo chest (Waldhausen, 1677). Such division led over the years to a rigorously applied design followed by most Austrian organs of the mid-18th century, with a half-case to one side of the west-end gallery (*Hauptwerk*), a second half-case to the other (Pedal) and

a *Rückpositiv* in front, the total gallery being spacious enough to accommodate a considerable choir and orchestra for the Mass on feast days. By 1740 or so, the keyboards would be placed (in the form of a detached console) in a commanding position on the gallery floor, and the various parts of the case strewn around the west-end windows, as in the large monastery organs of Ochsenhausen, near Biberach, or Weingarten. In theory such an arrangement might encourage idiomatic, two-chorus organ music of the north German type, but in practice it did not.

Organ by Christian Müller, 1735–8 (case probably by Jan van...

Little is known about the music played on the great series of Dutch organs built between the death of Sweelinck (1621) and the vogue for Bach's music two centuries later. But the array of mutations and flute and reed colours on the Laurenskerk instrument at Alkmaar would have made possible an immense variety in the settings of, and variations on, psalm tunes (probably improvised, as they are today). In the 1685 rebuild the *Hauptwerk* chest had to be lowered, perhaps because by then the organist wished to be able to accompany the congregation during hymns (but such accompaniment was then still new). It is clear how the Alkmaar organ developed from the Brabant organ of Niehoff with its limited pedal, big *Hauptwerk* chorus, 8' *Rückpositiv* used for solo effects, and a quasi-*Oberwerk* (here placed below the main chest, however) with stops found on the main manual of other European organs. According to John Evelyn's diary, such Dutch organs were used 'only for show and to recreate the people before and after their Devotions, while the Burgomasters were walking and conferring about their affairs'. By association, then, the organs were secular, often indeed owned by the town council, who saw such magnificent creations as objects of rivalry. Hence the building of the organ at St Bavo, Haarlem, by Christian Müller (1735–8) is to be seen as a sign of competition with Zwolle (Grote Kerk; new organ by Schnitger's sons, 1718–21), Alkmaar (rebuilt 1723–6), Amsterdam (Oude Kerk; Christian Vater, 1724–6), Gouda (Jean Moreau, 1733–6) and elsewhere. Moreau was from the south; but Müller, Vater and F.C. Schnitger were German, and from then onwards the Dutch organ was dominated by German builders who imported new ideas (big pedals from Hamburg, heavy voicing from Westphalia), added them to Dutch features, and produced large, powerful instruments, but unfortunately often without either German brilliance or French *éclat* (thin reed trebles and a Cornet designed to outline the psalm-tune melody rather than to function in a *grand jeu*). Marcussen mistakenly tried to 'correct' the organ at Haarlem in 1961 with new pedal Mixtures and a new Great Mixture which attempted to convert the 16' to an 8' chorus and which was reversed in the 1980s. Although such tonal matters are subjective, the cases themselves can be more clearly seen to have lost their native Dutch characteristics, particularly the well-featured, classical designs of the 17th century, and to have begun to sprawl. It is true that, at Haarlem, Müller and his architect kept the traditional vertical emphasis and other essential details in the arrangement of towers and flats; but even there the classical pediment surmounting the best old Dutch cases gave way to an unstructural, Baroque coat-of-arms ([fig.34](#)).

Organ by Joseph Gabler, 1737–50, in the west end of...

Although the condition of the organs at Weingarten and Haarlem is nothing like as authentic as their fame leads admirers to assume, they do serve on paper ([Table 26](#)) as useful examples of their 'schools', being at once both traditional and exceptional, both formative and unapproachably 'ideal'. The details of the Weingarten organ – the bells, the cherrywood stops, the ivory pipes, the doubled ranks, the undulating stops, the big Mixtures, the complex action – require a book to themselves, and it could be that a first-rate restoration of the instrument would fill out its tone. Nevertheless, the principles behind its dispensing of organ colours can be seen, and Gabler's little quire organ in the same church contained an even clearer indication of his passion for 8' and 4' colour stops. Some writers have described the west-end organ as a 'Rococo-Gothic conception', but it is more like a southern European grotto organ. Three echo-like divisions (*Oberwerk*, *Unterwerk*, *Kronpositiv*) are bound to lead to a mocking of true organ tone, however logical an extension it may have been of current ideas in south Germany as a whole. Only the two *Rückpositive* offer well-balanced effects in the idiomatic north German manner; yet to an 18th-century organist visiting Weingarten after Salzburg Cathedral (organ by J.C. Egedacher, 1703–6) such *Rückpositive* must have seemed conservative and slightly puzzling. The original mechanical action must have been very troublesome to make, since even in this sprawling and unique case ([fig.35](#)) only eight of all the case pipes do not speak; clearly the detached console was the only practical arrangement. The influence of the whole instrument was wide and long-lasting; theory books (e.g. *HawkinsH*; Bédos de Celles, B1766–78) gave it notoriety, and it held a significant position between the colourful Renaissance organ of south Germany and the large factory organs of the 1830s.

Swabia also saw a remarkably good compromise organ during the 1760s: the larger instrument at Ottobeuren, built by K.J. Riepp (1761–8), incorporated French elements (learnt by its builder in Burgundy) and German ones (learnt in the vicinity of Lake Constance). Most major organs in both parish and conventual churches in Switzerland, Württemberg and Bavaria had such a mingling of organ cultures as to create distinct styles of their own; but the one at Ottobeuren was a simple amalgam. All the classical French registrations were possible on it, but so were German pedal music and hymn variations, from the evidence of its stop-list.

Such composite schemes were curiously rare in the 18th century. It was more characteristic of organ building in general that even adjacent areas (e.g. Carinthia and Veneto, or Saxony and Bohemia) had totally different organs, as if builders of one area or religious denomination were thoroughly opposed to the ideals of their neighbours. Some of the major religious orders, particularly the Cistercian and Augustinian, had something of an international style crossing political frontiers, but even this kind of uniformity was not conspicuous. It was regional style that carried the day, giving the organ at Klosterneuburg, for example, great influence over the one built nearby a century later by a foreign builder well versed in other organ types (Augustinerstift, Herzogenburg; J. Henke, 1747–52). It may well have been such provincialism, however, that helped to produce the good, conservative designs (Amorbach; Rot an der Rot), the late flowers of Baroque organ art that were able to resist the extremes of fashion.

The large organs of the late 18th century were individually distinctive, keeping regional characteristics despite the availability to organists of many printed sources of music from other countries. The Michaeliskirche in Hamburg had a 70-stop, three-manual organ by J.G. Hildebrandt (son of Silbermann's pupil Zacharias Hildebrandt); although he took with him many Saxon colours (Cornet, Unda maris, Chalumeau etc.) and followed contemporary ideas common to many regions (no *Rückpositiv*, thickening Quints etc.), the instrument remained a Hamburg organ, more complete and comprehensive than an organ could have been anywhere else. The massive case (for which Burney did not care) has an appearance that anticipated the 19th-century; the stop-list ([Table 27](#)) is typical of a large organ, but many writers who heard the instrument commented on its 'noble power', described by Burney as 'more striking by its force and the richness of the harmony than by a clear and distinct melody'. Yet the organ was no mere sacrifice to fashion, which was then rather geared to imitations of orchestral families, of wind concertos, and the like. Theorists like Hess and Knecht encouraged particular imitations of string stops and in general helped to deceive organists into thinking they could duplicate orchestral effects. So did G.J. Vogler, who typifies the less reputable side of late 18th-century organ playing, and whose bizarre organ-concert programmes sometimes proved irresistible to popular audiences in large cities from London to Vienna. Vogler's [SIMPLIFICATION SYSTEM](#), however, has received more attention than it merits historically, for the development of the organ would probably have been little different without him. More important was the impasse brought about at the end of the century by the technical perfection of the late Baroque organ. Quite apart from the Napoleonic disruption, the organ historian must feel that the multiplied colour stops of St Florian and Oliwa monastic churches (1770s), the reeds of Saint-Maximin-la-Sainte-Baume, Poitiers and Toledo, and the choruses of Hamburg and Rostock parish churches, all pushed the classical organ as far as it would go. A total rethinking was necessary early in the next century.

Barbara Owen, Peter Williams

13. Organs in the Americas.

The first organs in the Americas were brought from Spain to Central America by Franciscan and Dominican missionaries in the mid-16th century. During the 17th century the use of organs – both imported and locally built – was widespread throughout Spanish colonial America: 17 small organs are reported as being in use in 1630 in what is now New Mexico (see §V, 9 above). By the early 19th century small organs were used in most mission outposts, including some in present-day California. In the northern French colonies, there was a church organ at Quebec City as early as 1657, and between 1698 and 1705 a two-manual organ was imported for Notre Dame, Montreal.

The first documented use of an organ in a church in the British or German colonies of the eastern seaboard dates from 1703. A small German religious colony had settled near Philadelphia in 1694, apparently bringing with it a small positive organ, and this was lent in 1703 for use at a Lutheran ordination ceremony in the 'Old Swede's' Church, Philadelphia. In 1713 a four-stop chamber organ of the 'Father' Smith school was placed in King's Chapel, Boston; it was mentioned as early as 1708 in connection with its original owner, Thomas Brattle, by the diarist Samuel Sewall, and it may have been imported before 1700.

English organs, including some significant examples of the work of Bridge, Jordan, Green, England and Snetzler, continued to be imported in increasing numbers to the eastern coastal colonies during the rest of the 18th century. The first person known to have built an organ in the colonies was Johann Gottlob Klemm, a Saxon who emigrated in 1733 and who built several organs, the largest of them a three-manual instrument completed for Trinity Church, New York, in 1741. His work was carried on by his apprentice, David Tannenberg, who built more than 40 organs between 1758 and his death in 1804, many for Moravian churches in a small area of Pennsylvania. His largest instrument, however, was built in 1790 for Zion Lutheran Church in Philadelphia. Other German-born builders, notably Philip Feyring, were active around Philadelphia during the late 18th century.

Tannenberg's work reflected the influence of the central German school, as transmitted by Klemm, but he also kept pace with newer European developments and was familiar with the writings of the theorist G.A. Sorge. Following in his footsteps were Conrad Doll and several generations of the Krauss and Dieffenbach families, who, culturally removed from the urban mainstream of East Coast organ building, continued to produce small organs in the 'Pennsylvania Dutch' tradition for rural churches well past 1850.

Puritan (Calvinist) objections to the use of instruments in worship prevailed throughout the northern colonies until the last decade of the 18th century, so that most of the early church organs were built for the Anglicans, Lutherans and Moravians. There is also evidence for a number of domestic chamber organs in this period. Most organs (of all types) were still imported, but after the mid-18th century a few American-built instruments began to appear in the colonies north of Pennsylvania.

The first true organ builder in Boston was Thomas Johnston, who, beginning about 1753, built a small number of church and chamber organs modelled after imported English instruments. Among his followers were Josiah Leavitt and Henry Pratt, both of whom built several small church and chamber organs, primarily for rural churches west and north of Boston. The prejudice against instruments began to break down in churches of the Puritan tradition by the 1790s, creating a new demand for church organs that was largely met by American builders.

These early New England builders were essentially self-taught and supported themselves only partly through organ building. New York and Philadelphia, however, attracted some English-trained builders during the final years of the 18th century. One of the earliest to arrive was Charles Tawse, who in 1786 advertised himself as a builder of 'finger and barrel organs' in New York. He later moved to Philadelphia, where he was joined in 1795 by John Lowe, trained in the workshop of Gray of London. The most notable emigrant, however, was John Geib, who shortly after his arrival in New York around 1798 built several substantial church organs, most of them for New York, although some went to other cities including Providence, Rhode Island.

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