UNIVERSITY OF SOUTHAMPTON

FACULTY OF ARTS

MUSIC

Doctor of Philosophy

THE DEVELOPMENT OF 'CLASSICAL' PRINCIPLES IN ORGAN BUILDING IN BRITAIN IN THE TWENTIETH CENTURY

Volume II

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1984

PART THREE

The Queen's College, Oxford
Frobenius, 1965

Chapter VII

The 'classical' revival in Britain from 1950 to 1980

The first organs in England demonstrating the unity of the organ as a musical instrument, instruments which were truly 'classical', were seen in the 1950's in the chapels of foreign communities in London. The first of these was in the Swedish Seamen's Church, built by Martensson, of Lund, in 1953, an organ which passed virtually unnoticed until an article appeared in The Organ in 1964.[1] It was a straightforward two-manual instrument of eleven stops:

Swedish Seamen's Church, Rotherhithe: Martensson, 1953

Manual I		Manual II (Swell)	
Gedackt	8	Rørfløjt	8
Principal	4	Kvintadena	4
Täckfløjt	4	Gemshorn	2
Oktava	2	Kvartian II	1 1/3
Mixture III	1 1/3		

Pedal	
Gedackt-Pommer	16
Nachthorn	4

This was followed by the van Leeuven organ, built in the same year, 1954, as the Royal Festival Hall and Brompton Oratory organs, in the Dutch Church, Austin Friars, a two-manual instrument of twenty-six stops, advised on by Martin Vente, of Utrecht.

The Dutch Church, Austin Friars: London, van Leeuwen, 1954

Hoofdwerk

Praestant	8
Roerfluit	8
Spitsgamba	8
Octaaf	4
Baarpÿp	4
Octaaf	2
Sexquialter I-III	
Mixtuur IV-VI	2
Kromhoorn	16
Trompet	8

Rugpositief

Holpÿp	8
Quintadeen	8
Praestant	4
Roerpÿp	4
Octaaf	2
Nasard	1 1/3
Scherp IV	1
Dulciaan	8

Pedal

Subbas	16
Praestant	8
Bourdon	8
Octaaf	4
Vlakfluit	2
Ruispÿp V	
Bazuin	16
Roerschalmey	8

Whilst being a not especially remarkable organ in terms of subtlety of touch, voicing, or architecture, and being partly enchambered and only partly encased, it was of interest in being the first instrument of recent times in England with the classical Hauptwerk/Rückpositiv disposition, as well as being a mechanical organ of fair size. These two organs, however, in terms of disposition and encasement did not achieve a totally convincing unity in a classical sense. The first instruments to achieve this were those in the Finnish and Danish Seamen's Chapels.

The Finnish Seamen's Chapel organ was by Marcussen of Aabenraa, and installed in 1958. That in the Danish Seamen's Chapel was by Frobenius, of Copenhagen, a one-manual of just five stops, installed in 1959.

Finnish Seamen's Chapel, London: Marcussen, 1958[2]

Manual

Gedackt	8	
Spidsgamba	8	(From F, bass from Gedackt)
Principal	4	
Rørfløte	4	
Octav	2	
Mixtur III-IV		

Pedal

Subbass	16

Danish Seamen's Chapel, London: Frobenius, 1959[3]

Manual

Gedackt	8	
Spidsgamba	8	(From C, bass from Gedackt)
Principal	4	
Rørfløte	4	
Gedacktpommer	2	

Though small, these two organs were distinguished in every way, having musical voicing, crisp, light playing actions, and fine distinctive cases, well proportioned and in harmony with their respective buildings. The drawings for the Frobenius organ (Appendix D, 12) show a logical approach, exemplified in the treatment of the roller board and stop action. The roller board casing has only the depth necessary to house the action, and the position of the stop-action levers (outside the case), allows the case to be proportioned exactly to the chest and pipe layout. It was also the first use in England of the Italianate ('Scandinavian', or 'Frobenius'), prospect, originally used in the 1950 Kalvehave organ (See Chapter III).

The location of these early classical organs, in little known chapels, led to their having little immediate impact, though Mander, who maintained the Danish Seamen's Chapel organ, obviously derived his early small mechanical-action organs, (such as that for the 1967 St. Alban's Festival) from the Danish organ. The early encased mechanical-action organs by English builders, Hill, Norman and Beard (e.g., Kircudbright, 1962, Maughold, 1964), and Arnold, Williamson and Hyatt (e.g., Harold Hill RC Church, Romford, 1964), owed more to an element of conservatism with regard to small organs for village churches than to any ideas of organ reform, though the Arnold, Williamson and Hyatt organ was a good, if plain, instrument.

In 1965 matters changed dramatically with the building of the organ by Frobenius in The Queen's College, Oxford. Here was an organ demonstrating all the tenets of classicism, and not situated in a small village or housing-estate Catholic church, nor in a foreign chapel, but in the centre of the 'establishment', in the University of Oxford.

The Queen's College, Oxford: Frobenius, 1965[4]

Great		Brustpositive (Swell)	
Gedeckt	16	Gedeckt	8
Principal	8	Principal	4
Rohrflute	8	Rohrflute	4
Octave	4	Gemshorn	2
Octave	2	Quint	1 1/3
Sesquialtera II	2 2/3	Scharff III	1/2
Mixture IV	1 1/3	Cromorne	8
Trumpet	8	Tremulant	

Pedal	
Subbass	16
Principal	8
Gedeckt	8
Octave	4
Mixture III	2
Fagot	16
Schalmei	4

The organ was due to the inspiration of James Dalton, Organist of Queen's, who had experienced the organs of Frobenius whilst playing abroad, and who pursued the installation of such an instrument with tenacity and singlemindedness.

In May 1960, Dalton, by then a Fellow, as well as Organist, of the College, raised the matter of replacing the thirty-two stop Rushworth and Dreaper organ, dating from the early part of the century. Reports were called for on the basis of an initial budget of £10,000. Proposals were sought from Harrison, Walker, Flentrop and Frobenius, and to a lesser degree from van Vulpen, Marcussen, Holtkamp (who refused on the grounds that an indigenous style would only develop if an English builder was employed).[5] Proposals were also submitted by Rieger. A committee of two Fellows, the Chaplain and Dalton considered

Table VII/1

The Queen's College, Oxford	Great	C–g'''	WP 60 mm

		C		c	c'	c''	c'''	g'''	
Gedeckt 16'	ϕ	155	Fs 119	93	51	28	17	13	1-24 Copper
	mw	1/4							25-56 35% tin
	mw	108		65	36	20	11.5	9	C-F 5 1/3'
	cu	1/2							As Ronne
Principal 8'	ϕ	139		76	42	25	16	13.5	C, Cs inside case
	mw	1/4							
	mw	68		36	20	11	6	5	70% tin
	cu	1/4							As Vig
Rohrflute 8'	ϕ	104		67	45	28	18	15	1-12 Copper
	mw	1/4.5							13-56 35% tin
	mw	81		50	35	22.5	14	11	Internal chimneys from c
	cu	1/2.4							As Rødevere
Chimney	ϕ			1/4					
	l			1/5	1/6	1/5			
Octave 4'	ϕ	82		47	26	16	14	12	55% tin
	mw	1/4							
	mw	62		37	20	12	7	6	As Vig
	cu	1/4							
Octave 2'	ϕ	45		24	13	7.5	5	4	55% tin
	mw	1/4							As Vig
	cu	1/4							
Sesquialtera II 2 2/3'	ϕ	49		28	17	10	7	5.5	55% tin
	mw	1/4.5							As Søborg
	cu	1/3							
Sesquialtera II 1 3/5'	ϕ	35		20	12	8	5	4	55% tin
	mw	1/4.5							As Søborg
	cu	1/3							

Note: Comments in margin "As Ronne", refer to earlier organs by Frobenius (see Friis, N. 1959), from which the scale was taken.

The Queen's College, Oxford	Great	C–g'''	WP 60 mm

	C	c	c'	c''	c'''	g'''	
Mixture IV 1 1/3' ø	28	15	9	6	4.5	4	55% tin As Søllerød
mw	1/4						
cu	1/4						
1' ø	20	12	8	6	8	6	
mw	1/4						
cu	1/4						
2/3' ø	16	9	6	9	6	4.5	
mw	1/4						
cu	1/4						
1/2' ø	12	7	11	7	5	4	
mw	1/4						
cu	opta						
Trumpet 8' ø	90	66	50	40	30	25	35% tin Closed square-ended shallots mounted in a mahogany block. (as Fig 26,3, Andersen 1969). As Holsterbro
lower ø	17	15	13	11	11	11	

Table VII/1

The Queen's College, Oxford	Brustpositiv (Swell)	C–g'''	WP 52 mm

	C		c		c'		c''		c'''		g'''		
Gedeckt 8' ϕ	100		58		37		24		14		10		1-12 Copper 13-56 35% tin
mw	1/4.5		1/4.2		1/4.2		1/4.2		1/4.2		1/4.2		As Sireköpinge
cu	1/3		1/4		1/4		1/4		1/4		1/4		Sweden
Principal 4' ϕ	72		39		23		13		9		8		55% tin
mw	1/4												As
cu	1/4												Gadstrup
Rohrflute 4' ϕ	67		41		25		14		9		7		35% tin Chimneys
mw	1/4.5												as on Gt. RohrFl.8'
cu	1/2.5												As Hüderup
Gemshorn 2' ϕ	51		32		21		13		8		7		35% tin
mw	1/4.5												2:3 taper
cu	1/3.5												As Landsby
Quinte 1 1/3' ϕ	28		16		11		7		5		4		55% tin
mw	1/4												As
cu	1/4												Svaneke
Scharff III 1/2' ϕ	13		8		5		6		4		3.5		55% tin
mw	1/4												As Aalborg
1/3' ϕ	10		6		4		8		4		3.5		
1/4' ϕ	8		13		8		6		4.5		4		
mw	1/4												
Cromorne 8' ϕ	13.5		13.5	fs 11.5	11		11	fs'' 10	10		10		55% tin Parallel,
l	291		203		138		125		51				beak shallots in a mahogany block, tubed from the front of the chest.
													As Sct. Andreas, Copenhagen.

Table VII/1

The Queen's College, Oxford	Pedal	C-f'	WP 65mm

	C		c		c'	f'	c''		c'''				
Subbass 16' ø	180		114		72	61							Copper As Kalvehave
mW	1/4.5												
Principal 8' ø	As	Great	plus		one	HT							70% tin As Vig ears to f
Gedeckt 8' ø	119		74		51	45							1-12 Copper 13-30 35% tin As Middlefahrt
mW	1/3												
Octave 4' ø	As	Great	plus		one	HT							55% tin As Vig
Mixture III 2' ø	40		24		16	4							55% tin As Helsingør
1 1/3' ø	29		18		12	10							
1' ø	23		14		10	8.5							
Fagot 16' ø	112	B 80	95		68	61							35% tin C-B 1/2 L Closed, square-ended shallots in mahogany blocks As Vandrup
lower ø	19	18	16		14	14							
Schalmei 4' ø 1	37		35		28	27							35% tin Double cone Closed shallots As Lynby
ø 2	25		17		12	10							
ø 3	12		11		10	10							
L a	100		81		47	39							
L b	345		144		42	13							

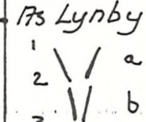


Table VII/1

The Queen's College, Oxford	Mixture Compositions			
Great				
Mixture IV C	1 1/3	1	2/3	1/2
fs	2	1 1/3	1	2/3
c'	2 2/3	2	1 1/3	1
fs''	4	2 2/3	2	1 1/3
fs'''	4	2 2/3	2	1 1/3
Brustpositiv Swell				
Scharff III C	1/2	1/3	1/4	
c	1	1/2	1/3	
c'	1 1/3	1	1/2	
c''	2	1 1/3	1	
c'''	2 2/3	2	1 1/3	
Pedal				
Mixture III	2	1 1/3	1	throughout

Source: Frobenius' scale charts and confirmed by notes made by Philip Wood during cleaning of the organ in July 1982. Cut up figures largely from Wood.

the matter and reduced the short list to two builders, Walker and Frobenius, but could not agree the final choice. The two Fellows favoured Walker, the Chaplain either, and Dalton, Frobenius, so that an inconclusive report was placed before the Governing Body. The Governing Body then voted as to builder, favouring Frobenius by seventeen votes to two, the two against being the Fellows on the Organ Committee! A motion was then considered to defer the project (the College having had a bad financial year), the vote was evenly divided and the decision to proceed was taken on the casting vote of the Chairman. The contract was then signed in January 1963.[6] Opposition to the course of action appears to have been considerable. In a memorandum (written when Clare College, Cambridge was considering a new organ), from "B.C." to members of Clare, it was stated that the Bursar of Queen's "convinced me that we should not have an organ built by a Danish firm."[7] The Provost of Queen's also wrote to the Master of Clare College, Cambridge:

> "I may say for your information that I met a knowledgeable American who was livid at the idea that a Baroque organ had anything of permanent value to offer. She thought the craze for these instruments a passing one. The whole subject, I believe, is controversial." 8

Dalton, who had played organs in Europe and America by Kuhn, Metzler, Flentrop, Marcussen, von Beckerath, and Rieger, as well as by Frobenius, was convinced that the work of Frobenius "had the particular character which would be suitable,"[9] and "that they not only appeared to understand what was needed but had ideas."[10] He had been particularly impressed with the 1956 Frobenius organ in St. Andreas Kirke, Copenhagen (Appendix A, 81).[11] It has been suggested, however, that Dalton favoured von Beckerath, "but because of anti-German sentiment in his Governing Body he had to settle for a Frobenius."[12]

Around the time of the discussions Dalton had played the Schnitger organ at Steinkirchen, and the overall layout at Queen's, of Hauptwerk, Brustwerk and Pedal towers was based upon Steinkirchen,[13] (though Frobenius did submit an alternative, more contemporary, arcaded design (Appendix D, 16), related to that in the Danish Church, Paris).[14] The case detail was by Fin Ditlevsen, a Danish architect friend of Frobenius, who was also an organist in Lyngby. Dalton asked for the comments of Stephen Dykes-Bower, who then submitted a re-designed version of the Ditlevsen case, a submission which was firmly rejected by the organ committee, who settled for Ditlevsen.[15]

The modest stop list, drawn up by discussion between Dalton and Frobenius, was designed primarily for organ teaching. Like the case architecture, it clearly had its roots firmly in the north German school; Dalton describes it as "a Buxtehude organ."[16] Nevertheless, the carefully conceived specification allowed a remarkable range of the organ repertoire to be performed. The Bourdon 16' was placed on the Great at Dalton's insistence - Frobenius was strongly in favour of a 4' Flute. The 4' Principal in the Swell was also a specific requirement of Dalton, as was the presence of solo registers on all keyboards. The placing of the Sesquialtera on the Great appears to have puzzled Frobenius, for the register actually arrived with a break at c, and a high-pitched bass. This was, at Dalton's request, taken right down to C as a Sesquialtera, in order that Bass de Tierce movements might be performed.[17] Dalton's clear understanding of the repertoire, and not just the north-German repertoire, underpinned the whole stop list.

The technical design, as shown by the section and prospect drawings (Appendix D, 13, 14 D, 15), as also by the full-size drawings in Frobenius' shop, was straightforward. The action, of wood (Appendix E, 20), follows the Gruntvig Kirke pattern, having floating beams (Appendix D, 14 and E, 21). The wind supply, from the blowers and a regulator in the base of the left-hand pedal tower, was to in-built regulators beneath the chests. (An additional regulator was added to the Swell in 1971, placed vertically behind the key-desk). The regulator form was similar to those in the Gruntvig Kirke, being hinged on one side, with the 'plate' having a flexible leather surround rather than ribs. The shape of the plate was trapezoidal and the hinge was placed on the longer side, the pressure being maintained by harmonium springs, and the total system giving a stable and satisfying wind supply. The coupler was of the backfall type (Appendix D, 14).

The scale sheets (Table VII/1) show that they were derived from those used by Frobenius in a variety of earlier organs; they originated from straight lines,[18] and show no peculiarities. The principal scales are fairly narrow and both mouth-width and cut-up are equally normal. The reeds, with closed shallots except for the Cromorne (Appendix, E, 22), are placed in solid mahogany blocks (Appendix E, 23), and have proved remarkably stable. The pipe materials (Table VII/1), show that a high tin content is only employed in prospect pipes. The organ was cone tuned, in equal temperament (Appendix E, 24).

The order of ranks on the chests, front to back, is:

Great		Brustpositive		Pedal	
Principal	8	Cromorne	8	Principal	8
Gedeckt	16	Scharff III		Subbass	16
Rohrflute	8	Quinte	1 1/3	Gedeckt	8
Octave	4	Gemshorn	2	Octave	4
Octave	2	Rohrflute	4	Mixture III	
Sesquialtera II		Principal	4	Fagot	16
Mixture IV		Gedeckt	8	Schalmei	4
Trumpet	8				

This order is followed by the stopknobs in the console (Appendix E, 25, 26). Leanings towards English taste were seen in the use of swell shutters on the 4' Brustpositive, though carefully screened by fine carving, and in the restrained voicing, which, whilst not without presence, was remarkably unforced and singing. The Brustpositive was also restrained in its output by the opening being very much less than the total height of the division, e.g., the Cromorne is completely behind the case (Appendix D, 13). The voicing was by Walter Frobenius and Frimodt Pedersen - who was very highly regarded by the Frobenius brothers. The organ arrived in mid-March, voicing commenced in early April and was finished at the end of June. Whilst voicing was in progress Dalton played to Frobenius and Pedersen for half-an-hour each day after lunch, and discussed progress. This latter procedure was regarded as of critical significance to the final sound of the organ.[19]

The corniced case, (a development of the Vamdrup[20] and Husum cases, as shown by Ditlevsen's sketches in Frobenius' workshop files), relates well to the early 18th-century architectural detail of the chapel, the towers echoing the pilasters on the walls. The downward swing of the Pedal towers allows the cornices on the wall an unimpeded 'run' in the rear corners of the building. The interplay of flat and round towers, and the use of small numbers of pipes, three in all the towers other than the Great centre tower, which has five, coupled with the rising mouth lines, gives the case especial grace and lightness. Of some charm is the use of single pipe towers, despite their being 'shams'. This feature is a purely architectural one which links the Hauptwerk and Pedal cases, and breaks the severe vertical line of the inside of the Pedal tower. Single pipe towers are also features of the 1654 organ in Haderslev Cathedral, and of the seventeenth-century Chair organ in Gloucester Cathedral. Haderslev, as Blanton points out, is also the "prototype of all organs with freestanding pedal towers"[21] and, as such, may be seen as the prototype for Queen's. The presence of the heavy eighteenth-century Choir screen at Queen's did cause the organ to be 'skied' too high visually, in relation to the Chapel as a whole.

The cost of the organ was £12,500,[22] and the fact that Denmark was in the European Free Trade Area gave Frobenius a slight edge financially over builders from Germany and Holland.

The organ received a mixed reception. Despite its being in an important Oxford College, or even because of it, it was regarded in general, as conversations with many builders and players have shown, with a certain mild disdain, and as an academic oddity. There were however exceptions to this. An undated memorandum in the Clare College, Cambridge, Organ File mentioned "Queen's outstanding architect-designed case", and went on to describe the action as "an astonishing tour-de-force", and the tone as showing:

> "Evenness of voicing;
> Clarity of basses (due to expert scaling and low wind pressure);
> Perceptible 'attack' of the diapasons, though no chiffing noises at all on the flutes;
> Plenty of volume but not the slightest piercing or screamy in tone;

> "Stops not contrasted in dynamic level but in quality - this means that even the most weird stop-combinations I tried 'worked' and were perfectly balanced - this results in an increase of variety;
>
> "A complete contrast in quality of tone between each division of the organ - it is always easy to tell which manual is being used."

There was also a remarkably positive review of the organ in the Musical Opinion, in which Edmund Eyre described it as "the best instrument I have managed to lay my hands on so far," and commented:

> "What Mr. Dalton has gained by the sacrifices he has made, and by spending funds rather differently to most Chapels ...
>
> "He has an instrument of beautiful appearance, with a case housing pipes of 70% pure tin.
>
> "He has an organ on which can be played a wide range of music with real fidelity.
>
> "He has an instrument which will surely leave its mark on all attempts to emulate classical voicing by any builders in this country who have a touch of humility in their make-up." 23

The influence of the Queen's organ on individuals such as Andrew Williams, then a student at Christ Church, and Maurice Forsyth-Grant is clear, and it would seem that a recital by Finn Viderø on January 27th, 1966 (which was a University Lecture), was a significant occasion for both Williams and Forsyth-Grant.[24] That the organ has remained a continuing influence is shown in Butterworth's remarks (1970): "The Danes certainly build outstanding organs, as witness... the beautiful Frobenius instrument in The Queen's College, Oxford."[25]

Whilst then the immediate impact of The Queen's College organ seemed less than might have been expected, it was not long before the matter of classical style and mechanical action was brought firmly to public notice by the decision of Ralph Downes to recommend that Flentrop should build the organ for the Queen Elizabeth Hall, London.

The ensuing furore over the appointment of a foreign builder to build an organ in a new major London concert hall almost equalled that over the Festival Hall organ. There was a bitter correspondence in the Musical Opinion, prompted by a letter from Leonard Ashby in which he asked:

> "Why the authorities have gone to a foreign firm and not given the contract to a British concern, especially bearing in mind that it is acknowledged British organs are the finest in the world. The decision to install a foreign instrument is surely a disgrace and insult to the British public and the British organ builders." 26

Ashby's letter was taken up by Albert Bentley (General Secretary of the National Union of Instrument Makers), who complained that the LCC had suspended Standing Order 225 (requiring competitive tendering), in order to accept Downes' advice in favour of Flentrop, that the LCC was "plainly unwilling to meet organ builders who know their subject" to discuss the matter, and went on to ask "why British organ builders have been really insulted and ignored in circumstances of mystery and anonymity?"[27]

Downes in the following (July) issue of the Musical Opinion reminded Bentley that he had "enjoyed the most cordial co-operation" with Harrisons and Walkers, as well as Kingsgate Davidson, Bishops and Taylors, and that it was his artistic discretion which led to his opting for Flentrop. He concluded his letter with the question: "Do British piano manufacturers regard themselves as insulted when Rubinstein (for instance) elects to play a German Steinway piano (without competitive tenders)?"[28]

The same issue of the Musical Opinion also published the LCC minutes relating to the decision to purchase a Flentrop organ, and the exchange of correspondence between the General Secretary of the National Union of Instrument Makers, the President of the Federation of Master Organ Builders (Henry Willis), and the LCC. The correspondence shows the hurt pride and considerable chauvinism of the English organ builders. Despite the clear bias of these letters, the LCC did delay confirmation of the order with Flentrop, and offered the Federation of Master Organ

Builders the opportunity to nominate work of their members in order that comparisons could be made with the work of Flentrop. The Federation however did not respond to this, and the LCC confirmed the order with Flentrop. Belatedly the Federation sent a list of recent work of their members which they felt would bear comparison with Flentrop; organs at Cookridge Parish Church, Leeds, and St. James, Bridgetown, Nova Scotia (!) by Hill, Norman and Beard; Francis Jackson's house organ, and the organ for Kingsland Church by J. W. Walker (this being then still incomplete in the factory!); Nottingham University Crypt Chapel organ by Willis; St. Vedast, All Hallows, London Wall (not a new organ), and Thirsk Parish Church (incomplete in the factory and again not a new organ), by Mander (who, incidentally, was not even a member of the Federation of Master Organ Builders!). Hardly a list to compare with the output of Flentrop, who by 1964, had built over one hundred new mechanical-action organs, apart from major historical restoration work.[29] The General Secretary of the National Union of Musical Instrument Makers described Downes as having a "pro-Continental bias," of lacking an "open mind," and suggested that "some organ building firms refuse to work with Mr. Downes with good reasons,"[30] though the General Secretary did not give any reasons. The matter was however settled, for the organ had been ordered on 21st April, 1964. The debate continued in the Musical Opinion until finally the Editor, Lawrence Swinyard, drew it to a close in October of that same year. As he commented, "one can only imagine.... that it is British pride and prestige which is threatened by this Dutch importation, rather than British pockets," and that "it may be remarked that those primarily responsible for bringing this case to attention are to some extent interested parties, having what are usually described as 'vested interests'"[31] - a fair comment.

That Ralph Downes' advice was sound regarding the choice of Flentrop is clearly shown merely by comparing the Queen Elizabeth Hall organ with the thirteen-stop Harrison organ (built in the same year, 1967, as the Queen Elizabeth Hall organ) in the Royal College of Music, as well as by comparison with the organs proferred by the Federation.

Queen Elizabeth Hall, London		Royal College of Music, London	
Flentrop, 1967[32]		Harrison and Harrison, 1967[33]	
Great		Great	
Chimney Flute	8	Stopped Diapason	8
Principal	4	Principal	4
Flute	2	Blockflute	2
Gemshorn	2	Cymbale III	
Mixture III	1		
Swell		Swell	
Gedackt	8	Spitzflute	8
Koppelflute	4	Rohrflute	4
Octave	2	Fifteenth	2
Sesquialtera II	4/5	Sesquialtera II	2 2/3
Krumhorn	8	Larigot	1 1/3
Tremulant		Echo Trumpet	8
Pedal		Pedal	
Sub Bass	16	Gedackt	16
Principal	8	Gemshorn	8
Gedackt	8	Koppelflute	4
Flute	4		

The 'design' restrictions for the Queen Elizabeth Hall organ were considerable: the organ had to occupy "a single narrow section of the concert platform; this section to be lowerable to the level of an underground storage alcove into which the organ could be rolled on metal tracks."[34] Tonally the placement of the Swell behind, even though somewhat above, the Great was not ideal, the position of the shutters affecting the tonal quality of the Great. The organ was "to function in the performance of chamber organ music and continuo."[35] As the drawings show, the superiority of the Flentrop organ (Appendix D, 17) was determined from the outset by the careful placement of the chests, Swell above (although behind), the Great, and as close together as possible, giving a good action run in which the additional horizontal travel to the Swell was compensated for by the placement of both chests and pallets. In turn a good tonal balance was determined by the height available for Great and Swell; Great 4' and Swell 2', the Swell speaking out over the Great. By contrast the Harrison organ (Appendix D, 18-22), has both chests on the same level, Swell behind Great, with a wide passage board between. The console is a large 'addition' to the front of the Harrison organ, unlike

Table VII/2

QEH	Great	C–g'''	WP 70mm

	C		c		c'		c''		c'''			
Chimney Flute 8' ϕ mw	110 1/4		72		49		32		22			
Chimney ϕ l	–		12 120		9 75		7 52		5 32			
Principal 4' ϕ mw	78 1/4		47		28		18.5		12			
Stopped Flute 4' ϕ mw	70 1/4		44		27		19		12			
Spitz Flute 2' ϕ mw	36/55 1/4		22/33		14/21		10/14.5		7/9			
Sesquialtera II 4/3–2 2/3' ϕ mw	22 1/4		21		21		12		9.5			
Sesquialtera II 4/5'–1 3/5' ϕ mw	26 1/4		15		14		8.7		5.5			
Mixture III 1' ϕ	26		15.5		9.5		6.5		5			

QEH	Swell	C-g'''	WP 70mm

	C		c		c'		c''		c'''			
Stopped Diapason 8' ϕ mw	100 1/4		67		42		29		20			
Koppel Flute 4' ϕ mw	66 1/4		44		26		16.5		12.5			
Octave 2' ϕ mw	45 1/4		27		16		10		7			
Nazard 1 1/3' ϕ mw	25/40 1/4.5	to	16/24 1/4		11/16		9/12		6/8			
Cremona 8' ϕ	39		31		25		21		18			
			Pedal				C-g'			WP 70mm		
SubBass 16' ϕ	139 x 74		110 x 88		72 x 56							
Principal 8' ϕ mw	140 1/4		85		50							
Stopped Flute 8' ϕ mw	100 1/4		67		42							
Spitz Flute 4' ϕ mw	55/88 75		38/55 50		28/38 35							

Table VII/2

QEH	Mixture Compositions			
Mixture III	C	1	2/3	1/2
	A	1 1/3	1	2/3
	fs	2	1 1/3	1
	cis'	2 2/3	2	1 1/3
	c''	4	2 2/3	2
Sesquialtera II	C	2/3	4/5	
	Gs	1 1/3	4/5	
	f	2 2/3	1 3/5	

Source: Flentrop scale sheet 24:3:1966

Table VII/3

RCM H. Ley Organ	Great	C–c''''	WP c.76 mm

	C		c		c'		c''		c'''				
Stopped Diapason 8' ϕ mw	102 1/4												Plain metal
Principal 4' ϕ mw	76 1/4		Harrison		Scale 4								Sp. m.
Blockflute 2' ϕ mw	51 1/5												As Clement Danes 4'
Cymbale III ϕ mw	1/4	and	Harrison Scales 5 and 7 1/4.5 respectively for unisons and quints										
			Swell										
Spitzflute 8' ϕ mw	– 2/9												As Bristol Cathedral 8' 1-7 stopped
Rohrflute 4' ϕ mw	– 1/4												As Trinity College, Oxford Pierced stoppers
Fifteenth 2' ϕ mw	– 1/4		Harrison		Scale 5								Sp. m.
Larigot 1 1/3' ϕ mw	1/4.5		Harrison		Scale 1								2:3 taper
Sesquialtera II 2 2/3' ϕ mw 1 3/5' ϕ mw	1/4.5 1/4.5		Harrison Harrison		Scale 5 Scale 6								
Trumpet 8' ϕ			Smallest		Harrison		Scale						French shallots

Note: For Harrison standard scale sheet see Appendix B4.

Table VII/3

RCM H. Ley Organ	Pedal	C–g'	WP c. 76mm

	C												
Gedackt 16' ϕ mw	187 1/4		Scale five pipes larger than Harrison Quintaton										Plain m.
Gemshorn 8' ϕ mw	137 1/4												sp. m.
Koppel Flute 4' ϕ			As RFH Swell										

Note: First 5 from Gemshorn in front and
24 from Principal in front plus
9 sham pipes in front.

Source.: Papers at Harrison and Harrison.

the 'built-in' Flentrop keyboards and console. The result is that the Harrison organ has a depth in excess of 3 metres as against 1.80 metres in the case of the Flentrop. This excessive depth, coupled with low placement of chests and larger pallets, inevitably produced an organ with a poor touch, especially to the Swell.

The specifications are superficially similar but Harrison was unsuccessful in attempting to build a Cornet on the basis of a tapered Swell Spitzflute. The overall physical size of the Harrison Swell organ (as also the stop list), shows clearly the attempt to provide a form of 'full-Swell', rather than a classical, or work-principle, relationship, between the two divisions as is the case on the Flentrop organ.

The scaling procedures in the Flentrop organ (Table VII/2), show a consistency, related to Groenlo and Doetinchem (Table III/3, 4), unlike the Harrison, which is an unhappy mix of Harrison standard principal scalings (Table VII/3), with a few 'reformed' voices, wide-scale Larigot and Blockflute, as also a 4' Pedal Koppelflute. Where the Flentrop organ had a deliberate use of differing tin contents for the pipework, the Harrison organ used basically spotted metal.

Neither organ is of any special visual beauty, but the weakness of the prospect of the Harrison organ is confirmed in its use of no less than nine sham pipes in prospect. Overall the Royal College of Music organ, other than in details of specification, remains essentially a horizontal Victorian organ, with all the associated problems of poor action-run and tonal balance - a sharp contrast with the logical work-principle approach of the Queen Elizabeth Hall. Tonally, mechanically, visually and in general execution the Flentrop is superior. This said, neither organ has an ideal layout and the Queen Elizabeth Hall organ is a rather ordinary box-style organ of fifteen stops, lacking the distinction of much of Flentrop's work. The cost of the Flentrop was "about £9,000"[36] the cost of the Royal College of Music organ being £6,250.[37]

That the Elizabeth Hall instrument made demands on recitalists (and their technique) is clear from Widdicombe, who commented that, despite the lack of enthusiasm on the part of the Royal Festival Hall authorities and Downes for solo recitals on the Queen Elizabeth organ, "we should have recitals on this instrument - providing we can find enough players whose sense and musicianship is sufficiently vital;"[38] she went on to review a full-scale recital by Hurford (who clearly thought differently from the authorities), who "was proved right to the extent that the audience would let him go only after three encores."[39]

The growing influence of these two organs, Queen's and the Queen Elizabeth Hall (together with that at Coloma College,[40] where Frank Bradbeer was the adviser, and the small organ by Torkildsen in Coventry Cathedral[41]), was added to by the establishment of the bi-annual St. Albans Organ Festival, in 1963, under Peter Hurford. Hurford, Organist of St. Alban's Abbey, was virtually the only Anglican cathedral organist, other than Jackson, to have shown any serious interest in 'organ reform'. The aim of the Festival was to promote the organ as a musical instrument and from 1967, the exhibition of new small organs became a part of the Festival. Also influential at Festivals were lectures by persons such as Downes (1964), Flentrop (1967), Phelps (1969), Glatter-Götz (1971), Vente (1973). The tide in terms of organ building style was turning, though the English organ establishment could only be said to resemble Canute.

By the mid-1960's decay among the establishment names in English organ building was rife. The work of Harrison's virtually ceased in any creative sense with the building of the Fairfields Hall organ in 1964. Hill, Norman and Beard maintained an establishment 'presence' until the rebuilding of Gloucester Cathedral organ in 1972. Willis as shown by his advertisement on the rear cover of <u>The Organ</u> in October 1966 (which stated that no work had been completed in the preceding twelve months and that no work was in hand), appeared to have effectively ceased building organs with any seriousness. Noel Mander continued on a wavering path between neo-classicism, extension organs, re-building and restoration, exemplified by his advertisement in the <u>Musical Opinion</u>, in 1964: "Tracker action where possible, electro-pneumatic where suitable, extension where necessary,"[42] a path coming, in effect, to an end in the monstrous rebuilding of the organ in St. Paul's Cathedral, an operation described by Dingwall as "one of the biggest puddles of spilt milk in recent English organ building history,"[43] or, more simply, by the distinguished German organ builder Hans Klais, as "preposterous."[44] J. W. Walker appeared to take up the 'classical' challenge, yet they were unable to convince prospective buyers that they could achieve results comparable with European builders such as Flentrop and von Beckerath, and so any real impetus faded after the organ for Merton College (1969). Amidst these fading and tarnished remnants of the nineteenth-century English tradition it was hardly surprising that the way was open for further change.

Gradually English organ builders began to dip their toes in the water and build mechanical-action organs. The firm of R. H. Walker was established in 1953 by Peter Walker, who, as a result of disagreements over policy, had been expelled the previous year from the Board of J. W. Walker.[45] By 1964, he was completely converted to "Organ Reform principles."[46] This conversion was a result of several influences: his employment of the elderly W. C. Jones, best known as a reed voicer, but who had been trained in flue voicing in a very 'old fashioned style' by Whiteley, was one influence. Another was the experience of hearing organs such as Alkmaar and Marmoutier, at the early International Society of Organbuilders Congresses in Amsterdam and Strasbourg. Most influential was a tour of new and restored organs undertaken by Peter Walker and his wife in 1962 in Holland, North Germany and Scandinavia, during which he visited many organs by Flentrop, von Beckerath, Marcussen, Frobenius and Magnussen. He was also influenced by conversations with Susi Jeans and his acquaintance with the musical activities of the Dolmetsch family.[47]

Under the name of R. H. Walker, Peter Walker built a number of new mechanical-action encased organs, initially positives at Lancaster (1965) and Redruth (1967).[48] These were based upon one by Magnusson, seen by Peter Walker in Flatas Church, near Gothenburg, in 1962. Magnusson gave Walker the action and chest drawings, together with the scale of the bass note of each rank. The flue pipes were bought in from Stinkens and the Regal, identical with that supplied to Magnusson, was by Giesecke.[49]

The extent to which Peter Walker was influenced by the work of Marcussen, Frobenius and Magnusson in Scandinavia can be seen in his advertisements from 1965 to 1973. An advertisement, typical of many of his in the musical press from 1965 to 1973, stated:

> "We are the only British organ designers and builders who have since 1964 been specialising solely in new organs with modern mechanical action and in the restoration of the best old instruments worthy of preservation.... Each instrument is individually voiced to suit the acoustics of the church in which it is to be placed. Larger two and three manual mechanical action organs in full accordance with Organ Reform Movement principles can also be specially designed and built." 50

As noted above, further evidence of change on a smaller scale could be found in the 1967 St. Alban's Festival, where small mechanical-action organs were exhibited by Mander, Grant, Degens and Bradbeer, and Peter Walker.[51] Also exhibited was an organ by Robbins, for Kingsnorth Church.[52] All these organs were however small and of limited impact. A more dramatic demonstration of mechanical action came in 1968 with the building of the organs by Peter Collins for Shellingford Parish Church and by Grant, Degens and Bradbeer for the Servite Priory, Fulham. Behind these two organs was not so much commercial concern as two men with ideas and vision, Maurice Forsyth-Grant and Peter Collins. These two organs, stemming clearly from organ reform movement thinking, stood not only in their own right as instruments, but could be seen as direct challenge to the establishment builders.

At St. Faith's Church, Shellingford,[53] a tiny medieval, village church with a seating capacity of around only ninety, the impetus for a new organ came from Andrew Williams, son of the patron of the living, **Sir Henry Williams.** Andrew Williams first came into contact with the organ, and central European organbuilding, when on a family exchange visit to Frankfurt. On his return to England he realised that "all was not well with the organ in Britain."[54] Subsequently, as shown by letters in the Shellingford file, he travelled widely throughout Europe.[55] As a student at Christ Church, Oxford, from 1965 to 1968, he was very aware of the building of the organ, by Frobenius, in The Queen's College, a matter made clear in correspondence with Maurice Forsyth-Grant and Peter Walker in letters relating to the Shellingford organ.[56]

In the summer of 1965 he wrote to the firms of Willis, Harrison, Nicholson, J. W. Walker, Hill, Mander, Grant, Degens and Rippin, and Rimmington asking for estimates and comments regarding the rebuilding on 'classical' lines, as also the possible reversion to mechanical action, of an electro-pneumatic organ by Lindsay Garrard, the specification of which was:

Great		Swell		Pedal	
Open Diapason	8	Gedackt	8	Subbass	16
Clarabella	8	Voix Celestes	8	Flute	8
Flute	8	Salicional	8		
Gemshorn	4	Viola	4		

William's outline stoplist, a not untypical neo-classical scheme, was:

Great		Swell		Pedal	
*Principal	8	*Gedackt	8	*Subbass	16
*Rohrflute	8	*Flute	4	*Flute	8
*Octave	4	Blockflute	2	Principal	8
Superoctave	2	Larigot	1 1/3	Mixture IV	
Mixture IV-V		Scharff IV		?Reed	
		?Krummhorn	8		

Note: *== existing stops re-used

The response from the builders was mixed: Harrison's accepted the proposals at their face value, at a suggested cost of around £7,500; Willis (£5,500); Hill (£5,800); Walker (£7,000); and Grant, Degens and Rippin (£5,000); the last with reservations as to the re-use of old material. Nicholsons indicated a lengthy completion time, and Mander did not get round to sending an estimate. Roger Yates was also written to, but, as his completion time was too long, this was not pursued.[57] In November costs were also requested from Arnold, Williamson and Hyatt; R. H. Walker, and Peter Collins. The former clearly felt Williams' proposals to be radical ones, as indicated in their letter of December 1, 1965:

> "does the church itself, as distinct from you yourself, really want an organ of this type? In other words, do they realize what they would be in for? We do not dispute that such an organ would be an exciting and refreshing change from the usual English organ, but are you quite sure that you would not be 'going too far' for the ordinary Anglican church?"

The response from Willis, Hill, Harrison, and Nicholson clearly did not convince Williams and, on December 27, he wrote to them stating: "I feel that our commission would not be an appropriate contract for your firm, and therefore wish to inform you that we will not be placing the order... with your firm." A similar letter was sent to Mander on January 4, 1966.

At the same time Williams' own stylistic preferences were becoming clearer, as indicated in a letter to Forsyth-Grant of December 24, 1965: "I know... that I would prefer to have an organ built by someone, such as yourself, who is more influenced by the German, rather than the Scandinavian school - pace Queen's" and, in a later letter to Forsyth-Grant, he also made clear his intention to "provide Shellingford with a real mechanical organ."[58] In the same letter he also shows his disquiet at the "very gloomy state" of English organbuilding and his intention to have an organ by an English builder, feeling, as "Holtkamp did, that every imported Organ is more of a hindrance to the movement than a help; I think it is unlikely that they will be used as models, but rather as curiosities. I think this is already happening with Queen's, sadly; for many it is too good to be true, or only for 'special places,' like Oxford Colleges."[59]

At the beginning of 1966 Williams began detailed consideration of the work and proposals of J. W. Walker; R. H. Walker; Arnold, Williamson and Hyatt; Grant, Degens and Rippin; and Collins. During this time the presence of the Queen's College organ, and especially the lecture-recital by Finn Viderøwas to Williams "a complete revelation", provoking the further comment from him that, "there is no doubt about it - first we have got to build real organs, secondly learn how to play them!"[60] The ensuing correspondence in the Shellingford file also shows the thinking of the builders concerned: Forsyth-Grant showed his predilection for the strong sound of Marcussen and Schuke,[61] as also his changing ideas "with the re-discovery and popularity of genuine French classic music."[62] Collins, fresh from his experiences in 1964 and 1965 with Rieger,[63] showed a clear grasp of both physical and tonal disposition in classical terms,[64] though at this point he had no new organ to demonstrate his ability in this field. J. W. Walker, on the other hand, in their proposals of November 26, and December 14, 1965, appeared unable to produce a balanced specification and, despite efforts by Williams to improve these, their final proposal of January 14, 1966 was:

Great		Swell	
Stopped Diapason	8	Rohrflute	8
Principal	4	Spitzflute	4
Blockflute	2	Principal	2
Larigot	1 1/3	Cimbal (29-33-36)	
Quartane II (12-15)		Shawm (or Musette)	8
Scharff III (22-26-29)			

Pedal	
Subbass	16
Principal	8
Gedeckt	8
Nachthorn	4
Furniture III (22-26-29)	
Dulzian	8

R. H. Walker, under Peter Walker, produced two thoughtful proposals,[65] the final one of nineteen stops being as follows:

Great		Front Positive	
Chimney Flute	8	Gedackt	8
Principal	4	Koppelflute	4
Quintadena	4	Principal	2
Recorder	2	Quint	1 1/3
Sifflöte	1	Cymbal I	
Mixture IV	1 1/3	Sesquialter II	
Musette	8		

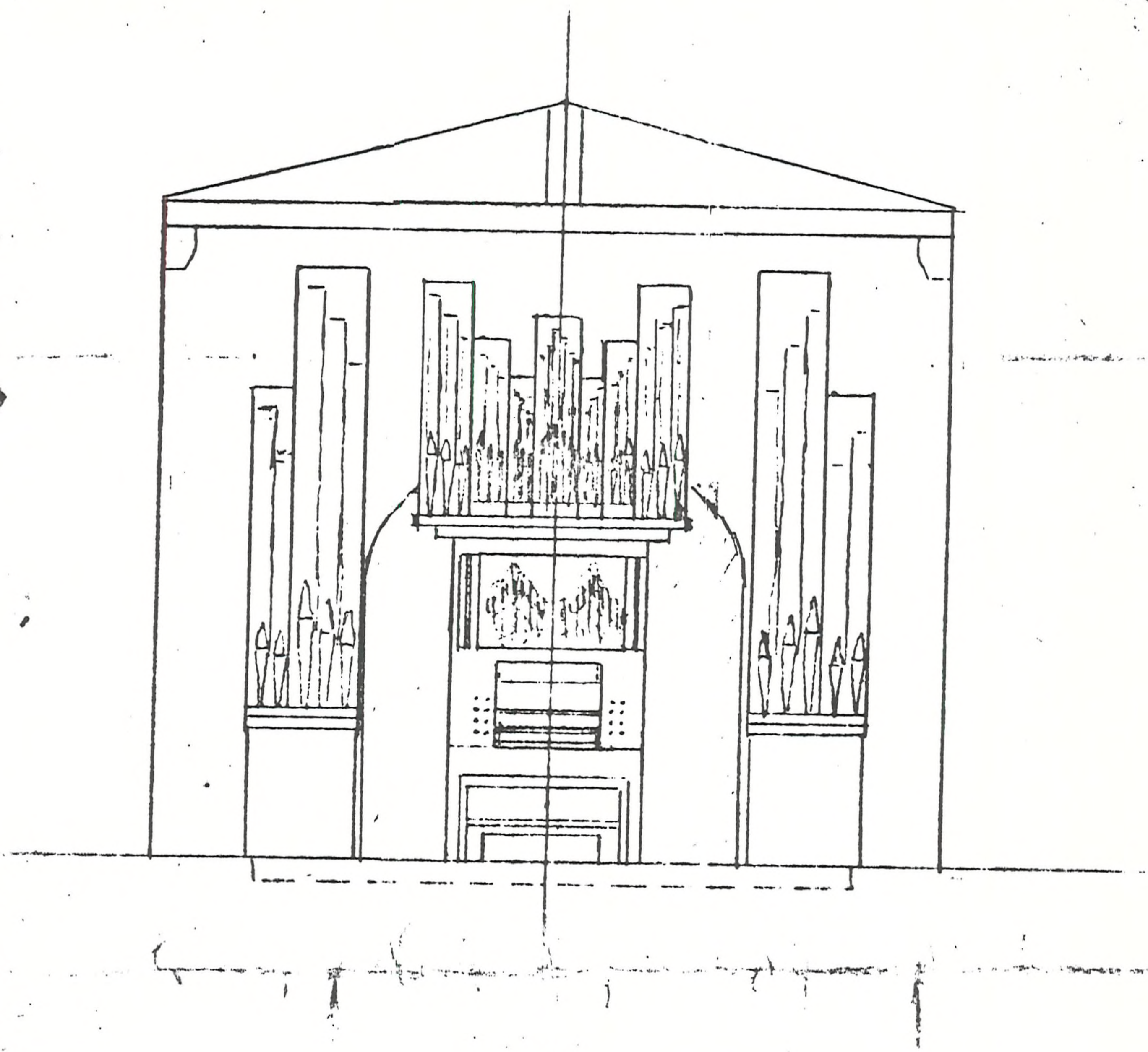
Pedal	
Subbass	16
Principal	8
Nachthorn	4
Mixture III	2
Regal Crumhorn	16
Schalmei	8

Peter Walker also proposed a case design (Fig VII/1), similar to Queen's, with Hauptwerk, Brustwerk, and free-standing, flanking, Pedal towers - an architectural solution in good proportion to the small church. In a letter to Williams, Peter Walker gave a reasoned commentary on his proposals and method of costing. He also made the point that any costing by an English builder could only be an approximation since "no English organbuilders have direct experience at present of building individual instruments of this size with mechanical action and up to the standards of construction which have been up to now associated only with the best continental organbuilders."[66]

The final estimated costs for serious consideration in January 1966 were:

J. W. Walker	(17 stops)	£7,753
Grant, Degens and Rippin	(18 stops)	£6,500
Peter Collins	(16 stops)	£5,020
Arnold, Williamson and Hyatt	(15 stops)	£6,750
R. H. Walker	(15 stops)	£9,000 - £9,540

Figure VII/1



SHELLINGFORD
PARISH CHURCH.
ELEVATION OF
PROPOSED NEW
TWO MANUAL AND
PEDAL ORGAN.

R.H. WALKER & SON
(ORGAN BUILDERS)LTD.
ORGAN ARCHITECTS
AND BUILDERS,
CHESHAM, BUCKS.
SCALE
¼ INCH TO 1 FT.

Against this background Williams took the decision, on April 22, 1966, to award the contract (provisionally) to Collins. The other builders were notified of the decision on the same day. In Williams' words to Maurice Forsyth-Grant: "The reason I choose Mr. P. D. Collins to do the organ for Shellingford was an artistic one. As far as cost was concerned, this was not important, and did not affect the final choice,"[67] though Williams, as expressed in his letter to J. W. Walkers, was conscious that, "tactically it would not seem very good if an organ were presented to the Church which would cost about three times the sum of the restoration scheme!"[68] The agreed scheme on April 21 was:

<u>Great</u>		<u>Front Organ</u>	
Rohr Flute	8	Wood Gedact	8
Principal	4	Koppel Flute	4
Recorder	2	Principal	2
Cone Flute	1 1/3	Sesquialter II	
Mixture IV		Cymbal III	
Cromorne	8	Musette	16
<u>Pedal</u>			
Subbass	16		
Principal	8		
Gemshorn	4		
Mixture III			
Trumpet	8		

Though the organ was to be a gift from Andrew Williams the proposal had to be taken to the Parish Council, who accepted the gift, and approved the application for a faculty.[69] As part of the faculty proceedings the scheme was duly scrutinised by David Lumsden, then Diocesan Organ Adviser for the Archdeaconry of Berkshire, and the faculty was granted in October, 1966.

During this period Williams discussed the scheme with both Lumsden and Dalton and, by December, when the contract (Appendix F, 8), was finally signed, the specification had been amended to divide the Sesquialtera into two separate ranks (though scaled as one register), and to place the 1 1/3' on the Positive. Work on the organ commenced by June 1967 and, in a letter to Williams, Collins mentioned that there was "10 inches of spare space on the Great soundboard,"[70] and a decision was taken to place both a Quintadena 4' and None 8/9' on the Great. In August, for reasons which are unclear, a further decision was made to change from mechanical to electrical stop action, and to provide three pistons for each manual. The final specification was:

St. Faith's Church, Shellingford, Collins, 1968[71]

Great Organ

Chimney Flute	8'
Principal	4'
Quintadena	4'
Recorder	2'
Mixture IV	1 1/3'
None	8/9'
Cromorne	8'
Tremulant	

Front Positive Organ

Wood Gedact	8'
Koppel Flute	4'
Principal	2'
Sesquialter	2 2/3'
Sesquialter	1 3/5'
Spitzquint	1 1/3'
Cymbal III	2/3'
Musette	16'
Tremulant	

Pedal Organ

Subbass	16'
Principal	8'
Gemshorn	4'
Mixture III	2'
Trumpet	8'
Tremulant	

Cymbal Star in G

As is clear from the contract, and inspection of the organ, its construction was a mixed affair. Much of the material was bought in; the metal fluework from Stinkens;[72] reeds from Giesecke;[73] the console chassis and coupler were by Heuss; and other action parts were by Heuss and Laukhuff.[74] As shown in the file,consideration was given to buying the soundboards in,but in the event the soundboards were made by Collins. The organ had in-built regulators, spring-loaded seals, and aluminium pallets. The case was of oak, laid on a frame of hollow steel girders.

The scales (Table VII/4), were drawn up by Collins on an 'intuitive' basis, simply drawn to scale on graph paper (Appendix B, 5). The organ was however somewhat overscaled for the small building. In general

Table VII/4

Shellingford	Great	C–g'''	WP c. 55mm

	C		c		c'		c''		c'''		g'''		
Chimney Flute 8' ϕ	110		72		41		26		18		14		30% tin Ears 1-37
mw	1/4												
cu	1/4												
Chimney ϕ	1/4												
L	1/4												
Principal 4' ϕ	85		50		30		17		10		7		1-25 90% tin remainder 75% tin Ears 1-37
mw	1/4												
cu	1/4												
Quintadena 4' ϕ	56		35		23		14		9		6		50% tin 43 upwards open
mw	1/4												
cu	1/4												
Recorder 2' ϕ	18/55		12/36		9/23		6/12		4/7		3/5		40% tin 1:3 taper to 1:2.
mw	1/5												
cu	1/4												
None 8/9' ϕ	27		17.5		11.3		7.3		4.6		3.8		75% tin
mw	1/5												
cu	1/4												
Mixture IV I ϕ	28/42		25		16/24		15		10		8		75% tin
mw	1/4												
cu	1/4												
II ϕ	27		16/24		13		12/15		9		7		75% tin
mw	1/4												
cu	1/4												
III ϕ	13/26		16		12/15		8		7/9		6		75% tin
mw	1/4												
cu	1/4												
IV ϕ	15		11/15		9		7/9		5		4		75% tin
mw													
cu													
Cromorne 8' ϕ	36		31		27		23		21		21		50% tin Cliquot copy Giesecke

Table VII/4

Shellingford	Front Positive	C–g'''	WP c. 50mm

	C	c	c'	c''	c'''	g'''	
Wood Gedact 8' ϕ	100	63	41	28	17	13	Utile. Based on Std. Diap. c. 1800 at Chicklade.
mw	1/4						
cu	1/4						
Koppel Flute 4' ϕ	75	51	33	21	13	10	50% tin Cannisters 1/3 L and 1/3 ϕ Ears 1-24
mw	1/4						
cu	1/4						
Principal 2' ϕ	45	30	18	11	6	5	75% tin Ears 1-24
mw	1/4						
cu	1/4						
Sesquialter II 2⅔' ϕ	60	32	18	11	7	6	50% tin Ears 1-37
mw	1/5	1/4	1/4	1/4	1/4	1/4	
cu	1/4						
1⅗' ϕ	33	19	10	7	5	4	50% tin
mw	1/5	1/4	1/4	1/4	1/4	1/4	
cu	1/4						
Spitzquint 1⅓' ϕ	21/42	14/29	10/20	7/14	4/8	4/8	50% tin Taper 2:1 Ears 1-17
Cymbal III ⅔' ϕ	npta						75% tin
Musette 16' ϕ	45	41	35	25	22	npta	50% tin L 1400 Giesecke

Table VII/4

Shellingtord	Pedal	C-f'	WPc. 70mm

	C		c		c'		f'						
Subbass 16' ϕ	200x 224		110x 108		58x 78		44x 64						1-20 from an old Bevington stop
cu	c. 1/4												
Principal 8' ϕ	135		90		50		41						1-12 Copper remainder 50% tin Ears 1-30
mw	1/4												
cu	1/4												
Gemshorn 4' ϕ	32/95		22/66		14/41		11/33						50% tin
mw													
cu													
Mixture III 2' ϕ	38/50		23/30		13/17		11/14						50% tin
mw	1/5												
cu	1/4												
1 1/3' ϕ	35		22		13		11						50% tin
mw	1/4												
cu	1/4												
1' ϕ	21/28		12/16		8/11		6/8						50% tin
mw	1/5												
cu	1/4												
Trumpet 8' ϕ	75		60		47								75% tin

Table VII/4

Shellingford	Mixture Compositions		

Mixture IV	C	1 1/3	1	2/3	1/2	
	c	2	1 1/3	1	2/3	
	c'	2 2/3	2	1 1/3	1	
	c''	4	2 2/3	2	1 1/3	
	c'''	4	2 2/3	2 2/3	2	
Cymbal III	C	2/3	1/2	1/3		
	c	1	2/3	1/2		
	c'	1	2/3	1/2		
	c''	1 1/3	1	2/3		
	c'''	2	1 1/3	1		
Pedal Mixture III		2	1 1/3	1	throughout	

Source: Scale sheets and various MS in P.D. Collins Shellingford file and discussions with Peter Collins both mouth-width and cut-up were 1/4. The Cromorne 8', on the Front Organ, was specified by Collins to Giesecke as in the style of Clicquot, the Musette 16' was a standard Giesecke register. Though Collins describes his scaling process as 'intuitive', files in his workshop indicate that he had by then collected a certain amount of scaling information from various sources. The metal contents (75% tin for principals and trumpet, 30%-50% for flutes, 50% for Cromorne and Musette), showed overall a liking for high tin content, associated at that time with the 'classical' organ. The Mixtures (Table VII/4), are straightforward: the Great Mixture is a standard quint mixture, breaking back one rank on each C, the Positive 'Cymbal' (Appendix C, 1), is really a small Scharff, complementing the Great Mixture. It is carried up very high, however, between f' and g''', emphasising the overall 'sharp' sound in the church. The use of tapered ranks for the quints in the Great Mixture, with the apparent intention of keeping the quints softer, did not give a satisfactory balance and blend and these were replaced in 1968 with parallel-sided ranks by Rogers.[75]

The key touch was reasonably precise, the repetition fair, but, when playing, the action tended to rebound against the keys. The problems of momentum and tension in the action had not been adequately coped with by Collins. The action was of the centre-pivoted backfall type, the tension in the action being maintained by a floating, or compensated, backfall beam. Whilst all the parts of the action were themselves satisfactory, they were not however positioned with the precision necessary for continuous trouble-free working. The aluminium pallets also proved very noisy in operation, in part due to too much free play.

Physically, as tonally, the organ was over-large for the church. It had a simple <u>Hauptwerk/Brustwerk</u> disposition, with the Pedal in attached 'towers' on either side, (the Pedal chests running from back to front) with 'box' style casing following the pipe contour (Appendix D, 23). By its sheer size, and 'weight', as well as by its lack of relieving detail, it dominated the west end of the church.

The opening recital, given by Nicholas Danby on May 5th, 1968, who was followed by many other English organists, such as James Dalton, David Lumsden, David Sanger, and by distinguished players from all over Europe, including Verena Lutz, Derimaeker, and Scholtz. The interest aroused by the organ was considerable and many listeners, players and prospective customers made their pilgrimage to this small church. The BBC broadcast the organ[76] and, later, a recording was made on the organ by David Sanger.[77] The organ did not, however, prove as reliable as hoped. By the end of 1968 a variety of mechanical adjustments had been made and, in December of that year, the in-built Great and Positive wind regulators were augmented by the addition of a (then) new reservoir and spring-damped Marcussen/Rieger style regulator, operating directly on the wind from the blower.[78] The organ continued to be beset with problems and on October 10, 1969 Andrew Williams decided to replace the electrical stop action with mechanical stop action. Pressure on Collins to complete the rebuilding of the Lady Chapel organ in St. Alban's Abbey for Peter Hurford led to the work being delayed, leading Williams to write on August 23, 1970, to the effect that:

> "No amount of enthusiasm can make up for not finishing properly. And that goes for any organ, whether it is in a great cathedral or a remote country parish." 79

By 1975 the irritation caused by persistent minor faults, and dissatisfaction with Collins' maintenance of the organ (due seemingly to the pressure of work under which he found himself) led the parish to commission a report from Grant, Degens and Bradbeer on the organ. The essence of the report[80] was that the organ functioned, but that the key action had been badly designed and set up, and that the mechanical stop action was too heavy: all in all a large number of faults were listed. The cost of restoration was estimated initially at £5,500[81] rising to £10,000 if Grant, Degens and Bradbeer were to replace the whole action. An estimate for refurbishing the organ was also obtained from J. W. Walker (cost c.£8,000).[82]

The reports of the deficiencies of the organ led Andrew Williams, in April, 1976 to write to his father stating his wish to "put right his mistakes." The writer was requested, on Williams' behalf, to obtain quotations for a new smaller and more reliable organ. Quotations were obtained from Rieger, Janke, Frobenius, Freiburger Orgelbau, Mathis, and Neidhart and Lhôte and, on July 11, 1978, the Shellingford Parish Council were offered, as a gift from Williams, a new two-manual organ, costing £16,000, by Rieger with the following disposition:

Manual I		Manual II	
Holzgedackt	8	Bibelregal	8
Principal	4		
Rohrflöte	4	Pedal	
Octav	2		
Quint	1 1/3	Subbass	16
Superoctav	1		
Sesquialter II			
Regal	16		

The Collins organ was to be sold to Worth Abbey, Sussex, any monies from the sale were to be given to Williams to defray the cost of the new organ. Under pressure at a Parish Meeting[83] from a local solicitor, David Millikin, and the Organist of Faringdon Parish Church (who both played the Shellingford organ), the Parish Council rejected Williams' offer: pride in a large organ taking precedence over a smaller organ of distinction. Thus a remarkable opportunity was passed over, both to house the Collins organ, suitably refurbished, in a building appropriate to its scale, and to provide a fine organ in good proportion to the medieval church. The Collins organ was eventually marginally refurbished at the parish council's expense, by Hill, Norman and Beard, the only change being the None becoming a 1'. Andrew Williams comment however was that he regarded the provision of a new organ at Shellingford merely as a "delayed pregnancy."[84]

Despite all, the fact that the Shellingford organ was built with such conviction in 1968 was remarkable. The risk taken by Williams to employ Collins was considerable; here was a young man with modest experience in a very ordinary firm, Bishops, followed by two brief visits, measurable in weeks, to Rieger. Whilst in the short term Williams was disappointed by the outcome, the position currently (1983) occupied by

Collins, arguably England's foremost builder of classical organs, suggests that the long-term results can now be seen in some ways as vindicating his decision to entrust the organ to a native English builder. Collins' strength was that he had travelled to gain experience (and was a competent organist), but it is not surprising that his inexperience led to the organ not having the qualities associated with builders such as Frobenius, Marcussen, von Beckerath and Schuke. That he built a mechanical-action, Werkprinzip organ of some twenty stops with a staff of one, and later two, equally inexperienced men (and the help of his wife) is amazing. If the artistic merits of Shellingford are now seen to be limited, this does not detract from the significance, nor the vigour and vitality of the organ. (It is also of interest to note in this instance the influence of Glatter-Götz of Rieger, not so much as a builder but as an educator of young organbuilders, an influence pervading all European organbuilding in the 1960's and 70's.) That Andrew Williams realised, whilst still at University, the true nature of the organ; as a wind instrument controlled from a keyboard, and his establishing "mechanical action as a foregone conclusion in the design of this organ,"[85] were equally remarkable, as was the well intergrated reformed style stop-list. Though the organ suffered from the excessive enthusiasm of youth, it was nevertheless a convincing unity which influenced many and won many friends.

Though Grant, Degens and Bradbeer were unsuccessful in obtaining the contract for Shellingford, they had made a certain impact with their organ for the 1967 St. Albans Festival. This was a striking eight-stop, two-manual and pedal organ, its black steel framed, red melamine faced, hardboard and teak-veneered plywood case (by Bradbeer) being described by Widdicombe as "a sensation to look at" and "with enough tonal personality to live up to its appearance."[86] Clutton commented that "altogether, this is a brilliantly clever and artistic little organ."[87] Its specification was:

Manual I		Manual II	
Rohrflöte	8	Regal	8
Principal	4	Gedackt	4
Blockflöte	2	Quinte	1 1/3

Pedal	
Sordun	16
Quintade	4

The influence of Grant, Degens and Bradbeer was growing, an influence enhanced by their organ for the Servite Priory, Fulham. The Director of Music there, Edward de Rivera, had been Choirmaster at St. John the Evangelist, Islington when the 1963 Walker organ was built and on his nomination, Alan Harverson was asked to advise. Harverson's brief was for: "a small organ about 25 stops (1) to accompany the choir in a wide repertoire (2) to accompany congregational singing, and (3) for concert use."[88]

The Servite Priory, London: Grant, Degens and Bradbeer, 1968[89]

Hauptwerk		Oberwerk	
Principal	8	Gedackt	8
Octave	4	Principal	4
Octave	2	Rohrflöte	4
Mixtur IV-VI		Spillflöte	2
Krummhorn	8	Zifflöt	1 1/3
		Scharff III	
		Trompete	16
		Trompete	8
		Clarion	4
		Tremulant	

Brustwerk		Pedal	
Rohrflöte	8	Subbass	16
Koppelflöte	4	Principal	8
Nasat	2 2/3	Flötenbass	8 + 4
Principal	2	Nachthorn	2
Terz	1 3/5	Posaune	16
Zimbel III			
Tremulant			

The primacy of eighteenth-century German music was, as the stop list shows, at the heart of Harverson's design.

The layout of the organ was a Werkprinzip one, though the disposition was that of a two-manual organ spread over three keyboards, Hauptwerk and Brustwerk being effectively one manual divided between two departments, the main principal chorus being on the Hauptwerk and the flutes largely on the Brustwerk. An unusual feature of the organ was the provision of double shutters for the Oberwerk. Their use was described by Harverson:

> "When performing classical music the front shutters are opened and those at the back closed; for echoes in this music, the front is closed and the back opened. For romantic music the Oberwerk is made softer than the Hauptwerk by the closing of the front shutters and the use of those at the back for expression." 90

The forceful, thin and driving sound was however clearly derived from the earlier Grant, Degen and Rippin tradition of post-War north-German neo-classicism.

The organ was a proving ground for many of Forsyth-Grant's technical ideas, including the use of chipboard and plywood in the soundboards, in-built regulators, pneumatic assistance (to lighten the touch of the Oberwerk), and the use of 'oil-filled dash pot' shock absorbers (by Kinetrol) to stabilize the floating beams and keep the action in tension. The keyboards and coupler action were by Laukhuff and other parts by Heuss were used. In the course of building the Priory organ Forsyth-Grant carried out tests in relation to action, winding and voicing, in which his engineering skill was invaluable, the results of which were considered by Forsyth-Grant to have influenced the pattern for later organs by Grant, Degens and Bradbeer.[91]

It was still possible, however, for the Servite Priory organ, in an undistinguished Catholic Church, and the Shellingford organ, built under the aegis of the Squire's son, to be regarded as a trifle eccentric. It was at this point that David Lumsden, Organist of New College Oxford, took the step of commissioning Grant, Degens and

Bradbeer to build a new organ for the College chapel. The water dripping on English organ building became a cold shower. For an Oxford college to commission a large mechanical-action, classical organ of forty-eight stops from a virtually unknown, non-establishment, English firm was unthinkable, but it happened.

David Lumsden had been influenced in his undergraduate days not only by Boris Ord and Thurston Dart, but also by Susi Jeans and Geraint Jones; he had also been to Oberlin, New York and other musical centres in America, and to Canada with Peter le Huray. These visits, from 1961 onwards, had brought him into contact with a world where performance and organ building styles were being discussed with an intensity and understanding quite unknown in England at the time, and where he discovered new organs such as the von Beckerath organ in St. Joseph's, Montreal.[92] Coupled with this was the experience of old organs, visited whilst on holiday, including Alkmaar, Haarlem and Zwolle, as well as the new Marcussen organs in Holland. Another turning point for Lumsden, in his view of the organ as a musical instrument, was at Cambridge, when he took a distinguished chamber musician to Evensong in King's College; the visitor rose and left after a few minutes, explaining later to Lumsden that he could not endure the bass part always being behind all the other parts! The natural result of all these experiences was that a mechanical-action organ for New College appeared the only acceptable way forward to Lumsden, if the College and University were to set a standard of excellence in educating organists.[93]

The decision to award the contract to Grant, Degens and Bradbeer was not taken without much deliberation. In the Spring of 1966 schemes for re-building the organ were considered from Hill, Norman and Beard, J. W. Walker, Harrison, Mander, and Rushworth. Gradually a scheme for a new mechanical organ was evolved, and the idea of re-building was discarded. (The death of H. K. Andrews, in 1966, also removed serious opposition to such a scheme.[94]) Estimates for a new three-manual organ Great, Swell, Rückpositiv and Pedal, were finally received as below; Harrison quoting only for electropneumatic action, the remainder for mechanical action:

Harrison	41 stops	£24,000 [95]
Hill	40 stops (14 old stops)	£18,550 [96]
Walker	36 stops (10 old stops)	£16,189 [97]
Mander	32 stops	£21,130 [98]
Flentrop	32 stops	£21,200 [99]
Casavant	39 stops	£28,000 [100]
	33 stops	£22,000 [101]
	25 stops	£18,000 [102]
Collins	41 stops	£19,400[103]

The response of the builders, and Lumsden's reactions to their proposals, are not without interest. Cuthbert Harrison was considered "too expensive and with no ideas of his own."[104] Herbert and John Norman of Hill, Norman and Beard did attempt a Werkprinzip design, using the old case, but suggested that "the layout of an organ mounted on a screen is always difficult,"[105] and that "tracker action is less desirable, or satisfactory, on the Pedal Organ."[106] Lumsden visited organs by Hill in Cambridge, Hyde Park Chapel and Heptonstall[107] but, though he thought them "the best of the English lot,"[108] they were "lacking experience... in the sort of organ I sought, with especially unsuccessful tracker action."[109] Walker's commented initially that, "we would have liked at least the manuals to have been tracker but unfortunately the space available on the screen is not sufficient to allow us to lay the instrument out in such a manner as to be able to use tracker action."[110] They did submit a mechanical scheme, but Lumsden considered that they had "no really successful instrument of the type I was seeking."[111] Mander,in a letter to Lumsden, criticised the "vogue to import masses of action ready-made from the trade houses in Germany,"[112] and stressed that von Beckerath had given him "the benefit of his experience so that we make our own action, assisted by his design,"[113] and concluding that "concerning prices I really cannot understand how anybody can be cheaper than we are."[114] Mander also submitted a drawing[115] which bore a remarkable likeness to the proposal submitted by Flentrop, but which appeared clumsy in proportion, and excessively deep. The similarity of the Mander and Flentrop costs is also noticeable. Lumsden's view was that Mander was "rather expensive and cranky,"[116] as also "doctrinaire."[117] Collins was thought by Lumsden to be "excellent" but with "not enough commercial stability or musical experience."[118]

Flentrop submitted a design for a case with a low centre section similar to the Choir organ in the Westerkerk, Amsterdam. Apropos of this design Hans Steketee, of Flentrop, wrote to Lumsden to the effect that, "Organ plus case are not two separate things, but are strongly related parts of one musical instrument."[119] Flentrop was regarded by Lumsden as "the best so far, but too expensive and not in touch with the organ as an accompaniment to the English Cathedral Service."[120] Casavant submitted three proposals, two of which would have had east and west prospects. Phelps, of Casavant, wrote to Lumsden suggesting that "unless you are dealing with von Beckerath, Marcussen, Schuke or Metzler, you will not be dealing with European firms whose work is comparable to ours"[121] and, with clear reference to the then recent organ in The Queen's College, "the work of Frobenius, for example is of an entirely different era; it is quite subject to all the ills associated with tracker instruments in the past."[122] Phelps also indicated in the same letter that, if Lumsden "would care to entrust the work to a progressive English firm like Grant, Degens and Rippin, I will be pleased to be associated with the project, in a rather unofficial way, to supply the technical and artistic guidance to assure your confidence."[123] The cost of Casavant, due in part to high import charges, was, like that of von Beckerath, too expensive.[124] When it is recalled that in the previous year Phelps, and Wolff and Wilhelm (both of whom had worked with Metzler), had been responsible for the remarkable Casavant organ in Our Lady of Sorrows Roman Catholic Church, Toronto, it is tempting to speculate upon the sort of organ that might have graced New College Chapel.

At this stage Lumsden "despaired of finding any other builder open minded enough to consider even the possibility that there were other ways of building organs as valid as his own!"[125] He goes on: "They all seemed opinionated and arrogant beyond endurance, with no concept of the organ as an adjunct to Anglican choral worship and determined to foist their pre-packaged instruments into any situation."[126]

As Lumsden wrote to Sanders, "Only at this final desperate stage did I call in Grant, Degens and Rippin (now Bradbeer). I had just heard of them but had, like you, thought of them as a small unknown company. Both Peter Hurford and Peter le Huray knew them well and had been pressing me to write to them all along."[127] Grant, Degens and Bradbeer, under the direction of Forsyth-Grant, appeared to Lumsden as the only firm "who were not content simply to copy earlier practice but who were devoted to re-interpreting the first principles of classical organ building in the context of the contemporary musical scene."[128] Forsyth-Grant's enthusiasm was contagious; as he wrote to Lumsden in the following year; "I am not doing Organ Building for my health, or to make a fortune, but more in the manner of conducting a mission."[129]

To the disappointment of the establishment builders the contract was settled with Grant, Degens and Bradbeer by mid-September, 1966.[130] In September, Lumsden attended a recital and discussion evening at the Hammersmith workshop, when Nicholas Danby and Martin Neary played a new, two-manual, mechanical-action, 'experimental' organ. In the same month Forsyth-Grant and Lumsden visited organs in Europe including the Grossmünster, Zurich, by Metzler; the Menlancthonkirche, Versöhnungskirche and Christuskirche, Düsseldorf, all by Schuke; the Heilig-Geistkirche, Düsseldorf, by Klais; and the Neanderkirche, Düsseldorf by Rieger.[131] Also visited, according to Forsyth-Grant, was the Rieger organ in Mönchengladbach[132] (Appendix A, 82), this latter being very influential.[133] In order to educate his work force Forsyth-Grant also took his men, by mini-bus, on a tour of organs in Germany, Holland and Denmark.[134]

The final specification, which was arrived at by discussion between Forsyth-Grant and Lumsden (well documented in the College Archives), resulted in an organ

> "primarily based on the North European School, which demands a chorus of Prinzipal tone in each division, supported by Flutes and Reeds in various proportions; some additional and very characteristic colours, however, also enable a true performance of French classical organ music. Certain stops, such as the Celeste, have a liturgical use while some modern Aliquot ranks provide the sounds necessary in modern German organ music. Moreover the need to

> accompany both the choir and congregation in a great variety of styles has been carefully considered in designing the instrument." 135

By 1969 the organ was completed and had the following specification:

New College, Oxford; Grant, Degens and Bradbeer, 1969[136]

Great		Rückpositiv	
Quintade	16	Holzgedackt	8
Prinzipal	8	Quintadena	8
Spitzflöte	8	Praestant	4
Oktave	4	Rohrflöte	4
Spitzgedackt	4	Prinzipal	2
Terz	3 1/5	Quintatön	2
Quint	2 2/3	Oktave	1
Oktave	2	None	8/9
Mixtur IV-VI	1 1/3	Scharfzimbel III	1/2
Cornet V	8	Holzregal	16
Messing Regal	16	Schalmei-Krummhorn	8
Trompete	8	Tremulant	
Tremulant			

Swell		Pedal	
Flûte à Cheminée	8	Prinzipal	16
Salicional	8	Subbass	16
Céléste	8	Oktave	8
Prinzipal	4	Rohrflöte	8
Flûte Conique	4	Oktave	4
Nazard	2 2/3	Nachthorn	2
Quarte	2	Mixtur IV	2 2/3
Tierce	1 3/5	Fagot	32
Larigot	1 1/3	Fagot	16
Teint II	1 1/7 + 16/19	Kupfer-Trompete	8
Fourniture V	1	Rohrschalmei	4
Trompette	16	Tremulant	
Hautbois	8		
Trompeta Real (Horizontal)	8		
Tremulant			

A number of influences on the overall design are clear. Lumsden, as quoted above, has summarised the musical ones, of which perhaps the most unusual were the requirements of the post-Reger Germanic composers, such as David, Reda, Pepping, Ahrens, Bornfeld, Zimmermann and Distler.[137] A file in the possession of Forsyth-Grant shows the clear influence of Josef von Glatter-Götz, of Rieger, and of the organs by him in Mönchengladbach[138] and Freiburg Cathedral.[139] The Marcussen

Table VII/5

New College Oxford	Great	G–g'''	WP 63 mm

		C		c		c'		c''		c'''		g'''		
Quintadena 16'	ϕ	76	Fs 61 G 97	82		55.2		40		29.2		25		
	mw	1/4												
Principal 8'	ϕ	148		85		50		29		17		12.5		75% tin stinkens
	mw													
Spitzflöte 8'	ϕ	–	G 67 B 61	108		64		39.5		27		22		C–Fs from Quintadena 5:8 taper
	mw	–	1/4	1/4.5		1/4.5		1/4.5		1/4.5		1/4.5		
Octave 4'	ϕ	81.4		46.3		28.5		17.7		11		8.2		
	mw	1/4												
Spitzgedact 4'	ϕ	47/83		29/51		18/31		11/19		7.4/12		5.9/9.5		stinkens
	mw	1/4												
Terz 3 1/5'	ϕ	90		54		33.5	f' 27 f's 23	15		10		7.9		25% tin C–f' 1:2 taper
	mw	1/5												
Quint 2 2/3'	ϕ	64		40		26		17		11		7		1:2 taper
	mw	1/4.5												
Octave 2'	ϕ	45.7		26.3		16.4		10.3		7		5.3		
	mw	1/4												
Mixture IV–VI 1 1/3'		1 1/3'	1'	2/3'	1/3'	1/6'	1/12'							stinkens
	ϕ	32.6	26.3	18.6	11.5	7.1	4.8							
	mw	1/4	for	unisons	and		1/4.5	for	quints	up	to	1/3'C		

New College	Great	C–g'''	WP 63 mm

	C		c		c'		c''		c'''		g'''		
Cornet V 8' ϕ	–		–	g 54	45		20		18.5				Rohrflöte 25% tin
(g–d''') mw	–		–	1/4									
cu	–		–	1/3									These scales appear to be the final ones, but the GDB papers relating to the Cornet are by no means clear.
4' ϕ				47.5	40		17		15.5				
mw				1/4.25									
cu				1/4									
2⅔' ϕ				39	33		15		14				
mw				1/4.25									
cu				1/5									
2' ϕ				32	27		12		11				
mw				1/4.25									
cu				1/5									
1⅗ ϕ				29	24.6		10		9				
mw				1/4.25									
cu				1/5									
Messing Regal 16' ϕ	npta												Made at Hammersmith.
Trompete 8' ϕ	94		79		60		46		46		46		c'''–g''' harmonic. Giesecke

Table VII/5

New College	Rückpositiv	C–g'''	WP 50 mm

	C		c		c'		c''		c'''		g'''		
Holzgedackt 8' ϕ	95x76		Laukhuff standard scale										Laukhuff
mw	1/4												
Quintadena 8' ϕ			54		35		22		14		11		1-12 from Holzgedackt
mw	1/4												
Praestant 4' ϕ	76.9		43.6		25.3		15.8		9.9		7.9		75% tin
mw	1/4.5												
Rohrflöte 4' ϕ	71		42		26		18		14		12.5		1:2 taper from Cs'''
mw	1/4												
Chimney ϕ	14		10		7		6		5				
Prinzipal 2' ϕ	45.9		26.3		16.4		10.2		6.6		5.1		2:3 taper
mw	1/4.5	to	1/4										
Quintatön 2' ϕ	35.5		21		12.5		8	g'' 6.5	6.1	g''' 7	4.8		1-25 felted cannisters 26-44 soldered tops, with ears 45-56 open
mw	1/4												
Octave 1' ϕ	24.3		15.1		9.3		5.6		3.4		npta		No breaks
mw	1/4												
None 8/9' ϕ	29		18.1		11.8		7.6		4.9		4.9		Top 7 notes break back
mw	1/6		1/6		1/5		1/5		1/5		1/5		
Scharffzimbel III	1/2' 14.3	1/4' 8.8	1/8' 5.7	1/16' 3.7									Stinkens
mw	1/4												
Holzregal 16' ϕ	18x18		16x16		16x16		14x14		13x13		13x13		French shallots
Krummhorn 8' ϕ	26		Standard Giesecke scale										Copper

Table VII/5

New College	Swell	C–g'''	WP 76 mm

	C		c		c'		c''		c'''		g'''		
Flûte à cheminée 8' ϕ mw	104 1/4.5		74		52		34		23		18		
Salicional 8'	1–12 from Flûte à Cheminée 8 remainder from previous Willis organ.												
Celeste 8'	From c, old pipes from previous Willis organ.												
Prinzipal 4' ϕ mw	85 1/4		50.5 1/4		30 1/4	f' 1/4.5	18.6 1/4.5		11.5 1/4.5		8.4 1/4.5		
Flûte Conique 4' ϕ mw	101 1/5		66.8		44		30		20.5		15		1:2 taper
Nazard 2 2/3' ϕ mw	70 1/4.5		42.5		28		18		12		7.5		2:3 taper
Quarte 2' ϕ mw	57.4 1/5		34.1		21.1		13.1		8.1		6		
Tierce 1 3/5' ϕ mw	40.5 1/4.5		24.1		14.9		9.3		5.7		4.2		
Larigot 1 1/3' ϕ mw	45.5 1/6	to	30 1/5		19		12		7.5		5		
Tient 1 1/7' ϕ mw	25.1 1/5		16.2 1/4.25		10.5 1/4.25		6.7 1/4.25						Languid 60°
16/19' ϕ mw	20.1 1/7		13.3		8.7								
Fourniture V ϕ mw	1' 25 1/4	1/2' 15	1/4' 10	1/8' 6.3	1/16' 4.5								50% tin

Table VII/5

New College	Swell	C–g'''	WP 76 mm

	C		c		c'		c''		c'''		g'''		
Trompette 16' ϕ	94	B 74	79		61.5		48.5		38		33		½ L bass French shallots
Hautbois 8' ϕ	100	F 90	80	e 75	70	f' 62	52	f'' 46	40				1–TT ½ L Giesecke
Trompeta Real 8' ϕ (horizontal)	92/115	F 82/103	70/88	f 62/78	53/66	f' 47/59	45/56		42/53				Copper Giesecke

Table VII/5

New College	Pedal	c–f'	WP 76mm

	C		c		c'		c''		c'''		g'''		
Principal 16' 8' φ	250		154		88		50	f'' 39.6					
mw	1/4												
Subbass 16' 8' φ	190.5x 152.4		From old organ at Fulham Priory										
mw	1/4												
Octave 4' φ	89.5		52.6		30.6	f' 24.4							
mw	1/4												
Nachthorn 2' φ	79		52		34	f' 29							2:3 taper
mw	1/6												
Mixture IV 2 2/3' φ	60.1		35		20.4	f' 16.1							
mw	1/4												
2' φ	47.9		27.9		16.1	f' 12.9							
mw	1/4												
1 1/3' φ	35.4		26.4		11.8	f' 9.4							
mw	1/4												
1' φ	27.9		16.1		9.4	f' 7.5							
mw	1/4												
Fagot 32' & 16' φ	154	F 137	140	f 125	105	f' 94	80	71					1-12 1/2 L
lower φ	27		24		20		16	15					Giesecke boots
L	445		440										
Kupfer-Trompete 8' φ	106		83		65	f' 59							Rogers
Rohrschalmei 4' φ	34		30.5		26	f' 24							Stinkens

New College	Mixture Compositions					
Mixture IV–VI C	1 1/3	1	2/3	1/2		
A	2	1 1/3	1	2/3	1/2	
fs	2 2/3	2	1 1/3	1	2/3	1/2
ds'	4	2 2/3	2	1 1/3	1	2/3
c''	5 1/3	4	2 2/3	2	1 1/3	1
g''	8	5 1/3	4	2 2/3	2	2
Scharf/Zimbel III C	1/2	1/3	1/4			
G	2/3	1/2	1/3			
d	1	2/3	1/2			
a	1 1/3	1	2/3			
e'	2	1 1/3	1			
b'	2 2/3	2	1 1/3			
g''	4	2 2/3	2			
g'''	4	2 2/3	2			
Tient C	1 1/7	16/19				
c''	32/19	1 1/7				
c'''	2 2/7	32/19				
Fourniture V C	1	2/3	1/2	1/3	1/4	
Gs	1 1/3	1	2/3	1/2	1/3	
e	2	1 1/3	1	2/3	1/2	
c'	2 2/3	2	1 1/3	1	2/3	
gs'	4	2 2/3	2	1 1/3	1	
e''	5 1/3	4	2 2/3	2	1 1/3	
c'''	8	5 1/3	4	2 2/3	2	
g'''	8	5 1/3	4	2 2/3	2	
Pedal Mixture IV	2 2/3	2	1 1/3	1	throughout	

Source: Scale charts at Grant, Degens and Bradbeer, Northampton, and New College Files in the posession of Maurice Forsyth-Grant.

nave organ in Freiburg[140] was also studied by Forsyth-Grant, and the further influence of Marcussen is seen in the use of the Quintatön 2' at New College, as in the Jaegersborg and Gruntvig organs, in Copenhagen.

The basic layout was a North German one, Hauptwerk, Rückpositiv, Brustwerk and Pedal towers. The Brustwerk was, however, expanded into a quasi-French Swell, with Cornet decomposée, Plein Jeu, Trompette, Hautbois and strings. This large Swell did however have the effect of raising the Great and distancing it from both the Rückpositiv and the player. Noteworthy was the employment of a Rückpositiv division, a division which was in the planning from the earliest stages. The Rückpositiv was the first by an English builder in the period under consideration, though not, as Clutton and Niland[141] suggest, the earliest in England, it being preceded by that in the Dutch Church in London some fifteen years earlier.

The initial prospect (Appendix D, 24), was for a Schuke-style glass and steel-framed box case, as at Sussex University, but with Hauptwerk, Rückpositiv and Pedal towers, the form being similar to Mönchengladbach (Appendix F, 9). Other case designs were proposed by the College architect, George Pace. These were described by Forsyth-Grant as "quite impractical."[142] Pace clearly had no concept of organ design, and File 14,367 in the College Archives is filled with the disagreements between Forsyth-Grant and Pace, and to some extent between Forsyth-Grant and the College. The reforming zeal and tone of Forsyth-Grant did not commend him to all, and the problems of the case design caused one senior member of the College to write: "I wonder whether the time has not come to cut our losses at this stage and find another firm."[143] The procrastination of Pace was considerable however, and gave the builders many problems. The final case design (Appendix D, 26, 27), was based on sketches by Pace but brought into final form by Bradbeer and Forsyth-Grant, with architectural detail by Pace, in particular the use of vertical aluminium channel (Appendix D, 39), and the 'apparent' case at the rear of the organ. This latter complex construction of oak, costing around £2,000 to make and erect,[144] was merely a screen behind the walkboards.

The sharp lines of the case, contrasting severely with the softer Gothic architecture of the Chapel, met with a mixed reception. Though Clutton and Niland described it as "a characteristically abrasive case by George Pace,"[145] Gillian Widdicombe's reaction was rather different. In a review of the opening, in The Times, she wrote, "Seeing the organ for the first time, one laughed with sheer pleasure at its visual freshness."[146] A conspicuous weakness of the case however is the indecisive manner in which the Pedal towers are related to the main case. The gap between the Great case and towers is insufficient to separate the towers completely, and does allow penetration of light from the west window, making the organ appear somewhat unfinished though in Pace's commentary, in a booklet issued at the opening, the design was described as "increasing the controlled aesthetic fragmentation and kinetic viewing" giving "ever-changing kinetic glimpses of the stained glass in the west window."

The production of so large an organ by a small firm meant that the organ was built in part in the Hammersmith workshop, and in part under sub-contract. The main-case and console woodwork was constructed by Pennells and Sharpe at Brandon[147] (Appendix D, 36, 40, 41), and consisted of basic chipboard and plywood boxes on a steel frame. Keyboards, pedal-board, couplers and chassis were by Laukhuff; stop knob units by Kimber Allen, with knobs by Heuss; and the console area completed with the stool from the old organ of the Royal College of Organists.[148] The soundboards were made at the Hammersmith shop and had plywood upper-boards, bearers and rackboards, chipboard table, hardboard bars and sliders of double faced hardboard. Two forms of slide seals were used, telescopic hulls by Verschueren on Great, Swell and Pedal, and Laukhuff seals on the Rückpositiv. The Swell soundboard had a bar dividing flues and reeds, but only one pallet. In the Swell, the pallets, of aluminium 'T' section, were very long, some as long as 533 mm. The Great pallets, of similar construction, were some 457 mm long.[149]

The wind supply was controlled by in-built regulators beneath the chests, with Rieger-style parallellogram springs (Appendix F, 10). Each spring was set in person, and signed, by Forsyth-Grant for tension and resulting wind pressure. The Tremulants (two oscillating pneumatic motors acting on the regulator pan) were of Klais design.[150]

The action was made in the main from Heuss parts, rollerboards were of plywood, with aluminium rollers, trackers were of wood for long vertical runs, aluminium wire for short runs, and steel wire to the Pedal. The length of horizontal run to Great and Rückpositiv (Appendix D, 28), and especially the use of flexible steel wire in the Pedal action, led to sag in the action and to a spongy touch, even though not excessively heavy (the Great and Swell touches being set at 4 oz. (113 gm) and 3 oz. (85 gm) respectively).[151] All the action was compensated and tensioned with floating beams and Kinetrol shock absorbers. These latter did not provide sufficient rigidity for the floating beams and contributed to the spongy touch, as did excessive friction due to too many points of movement (often as many as three rollers were employed for sideways travel in addition to two squares).

A matter not commented on to date was the application of pneumatic assistance to the mechanical action. Forsyth-Grant had first encountered the use of pneumatic assistance, to lighten bass notes, in organs by von Beckerath. The design employed at New College, supplied by Schuke,[152] was used on the Pedal, and on the Great and Swell manuals up to c'. There was also some limited use of electric action, difficulties with the speech of the Fagot 32' and problems of space in the Pedal towers having led to its adoption for the lower notes.[153]

The electrical piston capture action, made up under Forsyth-Grant's instructions from Dutch and Heuss parts, proved unreliable, apparently because hand registration was preferred by players, and thus the electrical parts only got irregular use.[154]

The pipe scales (Table VII/5) were by Forsyth-Grant and John Degens. They resulted from discussion with many individuals, but, as Forsyth-Grant's file shows,[155] were especially influenced by the Rieger organs in Freiburg and Mönchengladbach and the Marcussen organ in Freiburg. The reverberation characteristics of the Chapel were measured and the scalings adjusted against this, both in design and execution.[156] The scaling in general is on the narrow side, but never excessively so. Mouth treatment was in general conservative: 1/4 mouth-widths were mostly used for unison principals, 2/9 for quint principals, with some use of variable mouth-width progression. The trumpets all have open shallots. As shown in Table VII/5, the majority of the pipework was made of spotted metal by Grant, Degens and Bradbeer in Hammersmith; low octaves were of zinc, with mouths in spotted metal. Plain metal, around 25% tin was used for the Great Terz and Cornet. The Great Principal 8' and Pedal Principal 16', of 75% tin, were made by Stinkens. Also from Stinkens were the Great Spitzflute 8', Spitzgedackt 4' and Mixture; and Rückpositiv Scharffzimbel. The Rückpositiv Holzgedackt 8' was from Laukhuff. As indicated on the scale sheets, the Great Trompete 8'; Swell Hautbois 8', the so-called 'Trompeta Real' 8'; the Rückpositiv Schalmei-Krummhorn 8'; and Fagot 32'/16', and Rohrschalmei 4' on the Pedal were by Giesecke. A number of registers used copper — the Swell Trompeta Real, Pedal Kupfer Trompete (by Rogers), and Rückpositiv Schalmei-Krummhorn. Some extension was employed in the Pedal, the Fagot 32' and 16' being one rank, as were the Principal 16' and Octave 8' and the Subbass 16' and Rohrflute 8'.

The voicing was mainly by John Degens, though Matthew Copley voiced some of the reeds. The Hautbois, Trompeta Real and Fagot were pre-voiced by Giesecke. The Fagot 32' proved especially troublesome and a member of Giesecke's firm had to be sent to voice the register.[157] The flue voicing style was open-foot, applying Forsyth-Grant's experimental finding that the size of foothole to give equal pressure in the windchest and pipefoot was ten times the flue slit area.[158] No nicking was used in new registers, the pipework was slide tuned, and the organ was in equal temperament. The initial result did not satisfy Lumsden, and Claude Simonson, of Grant, Degens and Bradbeer did further work on the voicing, as later did ten Bruggencate and John Bailey. As File 14,369 in the College Archives shows there were considerable problems in getting the organ finished, understandable perhaps in view of its sheer size.

By 1982 age was seemingly improving the tonal character of the organ (though the Stinken's Principal 16' was beginning to collapse at the mouth under its own weight). The overall characteristic of the organ is of sharpness and loudness, and it has been the custom, since (and including) the time of David Lumsden, to leave the tuning access doors at the rear of the case open[159] (they cannot be observed from the floor of the Chapel because of the oak screen), ostensibly to allow more sound to reach the ante-chapel. This practice does however have the effect of reducing both sharpness and volume in the Chapel proper.

The convictions of David Lumsden and Maurice Forsyth-Grant certainly brought about an amazingly unified instrument from a firm of only fourteen men with, in 1969, little experience of building mechanical-action organs, even allowing for the help given by Glatter-Götz, von Beckerath, Schuke and, of course, the trade suppliers.

The extent to which Forsyth-Grant was personally a patron in terms of New College cannot pass unmentioned: half the cost of the tin prospect was paid for by him, since the College was unwilling to pay for a tin front.[160] Additionally the Teint and Messing Regal were gifts from him.[161] The full extent of his generosity was perhaps shown in the final cost to the College, £23,699 for 45/48 stops, excluding the sham rear case by Pace. The actual workshop costs were estimated by Forsyth-Grant at £32,000.[162] That the organ caused the firm financial problems is evident from the correspondence in File 14,369, and the experience led Forsyth-Grant to determine that from then on the firm would have to run on "strict business lines", as he had personally "lost as much as (he was) prepared to."[163]

Of the end result, the view of Lumsden, that "this organ represents the most far reaching development in English organ building since the Festival Hall organ of 1954,"[164] was entirely justified. Its presence and personality were a clear challenge to the establishment: here, to quote Lumsden, was "an instrument upon which the widest repertory can be played with reasonable authority and with tremendous musical impact - which is to me, the true authenticity!"[165]

The New College organ was followed by the building of a thirty-stop, three-manual, instrument, by Grant, Degens and Bradbeer for the Lyons Concert Hall, York University.[166] The York organ was an equally uncompromising 'reformed' organ, the sharp sound of which was driven home in an acoustic arguably even less sympathetic than that of the Royal Festival Hall. Though the organ was built in similar style to the New College organ it had two unusual features, a Moll-Terz-Zimbel, (1/2', 8/19', 1/3') or 'Glockenzimbel', in the Brustwerk (but, as difficulty was experienced in tuning it, it was later changed to a normal Zimbel with just octaves and quints[167]) and on the Pedal an unusual Mixture IV (5 1/3', 3 1/5', 2 2/7', 1 1/7'), which was essentially a Pedal 'Cornet'. Also at the same time was built an eighteen-stop two-manual organ for St. Paul's Girl's School, London,[168] a very cramped organ utilising an existing case, with the old prospect pipes forming a dummy front. This organ was however perhaps the last where Forsyth-Grant's influence was dominant - his interest in building organs was waning, and his hopes of changing the English 'organ establishment' in general were wearing thin.

Though the progress of classical organ building seemed slow to Forsyth-Grant at the time, nevertheless, with hindsight, it is possible to discern that a change was taking place. Peter (R. H.) Walker continued to build his series of small positives,[169] and J. W. Walker took the plunge and built two totally mechanical organs, one of three stops in St. Martin-le-Grand, York,[170] and a four-stop positive at Kirk Bramwith.[171] The St. Alban's Festival of 1971 also stimulated the building of a number of small organs, a two-stop instrument by Hill, Norman and Beard,[172] and three-stop organs by Rushworth and Dreaper,[173] and Grant, Degens and Bradbeer.[174] The small firm of Johnson of Cambridge also exhibited a five-stop organ,[175] one of a group of four similar positives.[176] The production of small organs was not, however, confined to instruments for the St. Alban's Festival exhibition. Wood Wordsworth, of Leeds, built two four-stop, one-manual organs in North Rigton and Tangmere.[177] These arose from a visit by Peter Wood, in company with Nicholas Danby, to north Germany where they visited the workshop of Ahrend and Brunzema, and saw a small positive under construction. This interested Peter Wood, and he requested a set of drawings and permission to build a similar organ himself. The North Rigton and Tangmere organs are basically to the Ahrend and Brunzema design, though Peter Wood added (to the detriment of the prospect), one additional pipe in the centre tower,[178] and the organs were built from materials and pipes that happened to be around in his workshop at the time.[179] The result was two rather undistinguished small organs, yet the exercise was note-worthy in that the interest of a player, Danby, and a European firm, Ahrend and Brunzema, had made an English builder try his hand at building two (almost) new classical organs.

Another influence from Europe was the arrival in England, as a result of marriage to an English nurse, of a Dutchman, Hendrik ten Bruggencate. He had first worked with Pels, in Holland, and then, for a short time, with Metzler, in Switzerland. In 1967, after settling in Oxford, he built a small, five-stop, positive organ[180] (Appendix B, 4, D, 42), designed after one he had worked on when with Metzler (Appendix E, 27). Although the organ did not have the finesse of Metzler, it was clearly in classical style. The extent to which ten Bruggencate had assimilated the Metzler style (as compared with the lack of appreciation of the qualities of Ahrend and Brunzema, by Peter Wood), is evident from the drawings on opposite pages in The Classical Organ in Britain.[181]

The positive was seen by the writer, and led to ten Bruggencate being commissioned to build a six-stop organ for St. John Bosco Roman Catholic Church, Woodley, near Reading.[182] The brief from the Parish Priest was simple: the organ was to cost no more than an electronic instrument, i.e., around £1,000. In the event it cost £1,150. The organ has a simple box-style case in cedar, noteworthy for harmonising a 16' pedal stop with a 2' manual principal in prospect and also for the use of 'simplified' single pipe towers, an idea derived from Queen's College (Appendix D, 43). The organ was built in six months, between June and December 25, 1970, the metal pipework (Table VII/6), coming from Stinkens. Tonally the organ resembles the work of Metzler. Despite some roughness of internal construction the consistency of design is shown by the fact that the prospect layout, with its single pipe towers, was carried through to the windchest layout (Appendix E, 28, 28a).

It was perhaps unfortunate that, having demonstrated his capability, ten Bruggencate, in 1970, moved to Grant, Degens and Bradbeer at a time when their work was losing impetus. It is possible that ten Bruggencate could have done much to revive the firm's spirit, but the personalities in the Grant, Degens and Bradbeer workforce and that of ten Bruggencate could not co-exist and, whilst the instruments for Dunchurch,[183] Belfast University,[184] Lurgan Convent[185] and Woodford[186] were built in a style less aggressive than those of New

Table VII/6

St. John Bosco RC Reading	Manual	C - f'''	

	C		c		c'		c''		c'''				
Holzgedackt 8' ϕ	90x61		64x31		42x23		28x16		19x7.5				Oak
cu	29		19		11		7		4				
Rohrflöte 4' ϕ	62		38		24		15		12.5				65% tin stinkens
mw	1/4												
cu	1/3.5												
Chimney ϕ	12												
L	70												
Prinzipal 2' ϕ	45		27.5		15.5		9.6		6.7				87% tin stinkens
mw	1/4												
cu	1/4												
Quinte 1 1/3' ϕ	32		19		11.5		7		5				87% tin stinkens
mw	1/4.9												
cu	1/4												
Octave 1' ϕ	26		15.8		9.1		6.5		4.2				87% tin stinkens
mw	1/4												
cu	1/4												
			Pedal				C - f'						
Quintatön 16' ϕ	169x138		100x80		59x47	f' 47.5x38							Cedar
cu	41.2		24		npta	npta							

Source: From MS notes by ten Bruggencate in the posession of Dominic Gwynn, Northampton.

College and York, his connection with the firm ceased in 1973, when he recommenced work on his own.

Whilst Oxford now had two classical organs of substance, Cambridge had no convincing instrument of this genre. Inevitably, though some five years later, came the Cambridge response to the Oxford Frobenius, the installation of the von Beckerath organ in 1970 in Clare College Chapel. In 1964, a committee, convened by Nicholas Temperley, of the Master, three Fellows and two undergraduates, including the Organ Scholar, met to consider the repair, or replacement, of the existing organ.[187] Advice was sought from a number of Cambridge musicians, including David Willcocks and Peter le Huray, and also James Dalton of Oxford.[188] Early in 1965 Temperley and le Huray visited the Walker organ in Kingsland and Temperley wrote: "I now feel personally convinced we should have a new organ, but not identical to the Kingsland organ, but one using many of its features."[189] In March 1966 (by which time the Frobenius organ was installed in Oxford), Temperley wrote to Frobenius, Flentrop, Metzler, von Beckerath, J. W. Walker, Mander, Hill, Norman and Beard, and Grant, Degens and Rippin, seeking quotations for a new two-manual organ of some twenty stops.[190] Dalton, who had played a number of von Beckerath instruments which greatly impressed him, also pressed the case for mechanical action. Temperley, as mentioned earlier in this chapter, wrote to the Master of Clare and referred to Dalton "wanting a Beckerath organ for Queen's,"[191] and that he (Temperley) had "heard and inspected two Beckerath organs", and was "an enthusiastic admirer of his organs,"[192] going on to suggest that "we could do for Cambridge what Queen's did for Oxford."[193]

The College Bursar and Finance Committee took the line that "nothing was too good for Clare,"[194] and that Temperley (who was not an organist, and relied on the opinions of Dalton and le Huray),[195] was to "find the best organ builder in the world, regardless of expense, and to get an organ which would add lustre to the College and attract interest and visiting organists of distinction."[196] The fact that von Beckerath appeared the most expensive was also much in his favour.[197] The attempt to emulate Queen's was clear.

The contract was signed with von Beckerath in August 1967,[198] the estimated cost being £17,475.[199] Initially Dalton suggested a specification of around eighteen stops, but von Beckerath's initial tender was for twenty-one stops. In the end, like the Frobenius, it became an organ of twenty-two stops, of almost identical specification and physical layout, but of a very different character. Here in England, for the first time, was a reformed instrument from north Germany, an organ of assured skill and craftsmanship, well finished in all respects. Despite this, in its very Germanic thoroughness, it lacked sensitivity, tonally or architecturally, for the gentle subtlety of the chapel, an eighteenth-century building of quiet distinction.

<u>Clare College, Cambridge: R. von Beckerath, 1970</u>[200]

Great		Swell	
Principal	8	Gedackt	8
Rohrflöte	8	Principal	4
Octave	4	Rohrflöte	4
Blockflöte	4	Octave	2
Nasat	2 2/3	Larigot	1 1/3
Flachflöte	2	Sesquialtera II	2 2/3
Mixtur V	1 1/3	Scharff	1
Trumpet	8	Bärpfeife	8
		Tremulant	

Pedal	
Unterbass	16
Principal	8
Choralflöte	4
Rauschpfeife IV	2 2/3
Fagott	16
Schalmei	4

Seen in prospect, on paper (Appendix D, 44), the lines of the case relate clearly to the lines of stalls, screen and roof. In reality the stark, unadorned boxes of light oak appear a harsh intrusion into a gentle classical chapel, with its darker woodwork, the opposite of the classically moulded case by Frobenius in Oxford. The sound is similarly too forceful and driving for the small chapel. Temperley described the organ as being "a bit too loud for the chapel and not particularly well suited to accompanying services."[201] The reasons for this loudness are not completely clear, though some suggestions

Clare College, Cambridge	Great	C-g'''	WP 70 mm

	C		c		c'		c''		c'''				
Principal 8' ϕ mw	142 1/4.5	to	86 1/4		51		29		18				
Rohrflöte 8' ϕ mw	113 1/4		78		53		36		21				
Octave 4' ϕ mw	86 1/4	to	50 1/3.5		28		17		10				
Blockflöte 4' ϕ mw	29/90 1/4.5		19/59		13/41		9/26		6/18				
Nasat 2 2/3' ϕ mw	37/72 1/6		21/44		13/29		8/20		5/13				
Flachflöte 2' ϕ mw	41/60 1/4		25/40		15/27		9/17		5/12				
Mixtur V 1 1/3' ϕ mw	25 1/4		16		9		6		4				
Trumpet 8' ϕ	94		73		59		49		45				French shallots

Table VII/7

Clare College	Brustwerk Swell	C–g'''	WP 70 mm

	C		c		c'		c''		c'''			
Gedackt 8' ø	98 x 74		64 x 48		42 x 32		27 x 21		18 x 13			
Principal 4' ø mw	76 1/4.5		47		26		16		9			
Rohrflöte 4' ø mw	69 1/4.5		46		31		20		5/16			
Octave 2' ø mw	43 1/4	to	26 1/4.5		15		10		6			
Larigot 1 1/3' ø mw	33 1/4		19		11		7		5			
Sesquialtera II 1 3/5 mw	36 1/4		22		13		8		5			
Scharff IV 1' ø mw	23 1/3.5		13		8		5		4			
Bärpfeife 8' ø	81		81		67		55		44			

Cylindrical with triple cone
See Dwg. App D, 45-46.

Table VII/7

Clare College	Pedal	C–g′	WP 80 mm

	C		c		c′			
Unterbass 16′ ϕ mw	174× 174 1/4.5	F 197	147		89			C–E stopped wood from F in prospect
Principal 8′ ϕ mw	154 1/4.5	16 1/4	94		58			
Choralflöte 4′ ϕ mw	85 1/4.5		51		31			
Rauschpfeife IV 2⅔′ ϕ mw	57 1/4		35		21			
Fagott 16′ ϕ	68		57		48			Cylindrical
Schalmei 4′ ϕ	65		51		42			Conical

Mixture Compositions

Mixtuur V C	1⅓	1	⅔	½	⅓			
c	2	1⅓	1	⅔	½			
c′	2⅔	2	1⅓	1	⅔			
g′	4	2⅔	2	1⅓	1			
c″	4	2⅔	2⅔	2	1⅓			
g″	5⅓	4	2⅔	2⅔	2			
cs‴	8	5⅓	4	2⅔	2			
Scharff IV C	1	⅔	½	⅓				
c	1⅓	1	⅔	½				
c′	2	1⅓	1	⅔				
c″	2⅔	2	1⅓	1				
g″	4	2⅔	2	1⅓				
Pedal Rauschpfeife		C	2⅔	2	1⅓	1	throughout	

Source : von Beckerath scale sheets n.d.
letter from N. Deichmann (von Beckerath) 1:8:83

may be made. While the scales (Table VII/7), are not very wide, and the principal mouth-widths are also on the narrow side (as might be expected in such a small chapel), the wind pressures and cut-up of the pipes are relatively high. These latter would seem to result from von Beckerath's windchest construction, which employs generous channels, and from his voicing technique, in which wide flues play a prominent part, the whole making for a 'wind-hungry' organ.[202] Possibly the most critical factor lies in the placing of the organ, and especially the Hauptwerk, high in the centre of the barrel of the chapel ceiling (Appendix D, 44), coupled with the short length of the chapel. The final voicing was by von Beckerath in person,[203] who at this time was approaching seventy, and it is possible that his hearing and judgement were affected by his age. Von Beckerath was apparently asked to return to the Chapel on account of the forcefulness of the organ but remained of the opinion that the organ was satisfactory.[204] When, in 1971, von Beckerath's attention was drawn by the writer to the loudness of the organ,[205] he replied, "I have to point out in this connection however that the excess of sound which you criticised is not the result of overscaling but chiefly due to the acoustics of the room, with too much reverberation"[206] (!) The question remains as to whether such a forthright builder was really capable of coming to grips with a relatively large organ in a small resonant chapel.

Technically the organ is typical of the work of von Beckerath (and other post-War, north-German builders such as Führer, Hammer, Kemper etc.); it is essentially a 'modern' organ. The action is centre-pivoted and the tension is maintained by floating beams and pneumatic motors, (Appendix D, 45, 46). The trackers are of aluminium wire and the backfalls are metal. Pneumatic assistance is used in the Pedal Organ, and the wind supply (Appendix D, 45, 46), is from a large reservoir, and each windchest has an in-built regulator. To assist the blend of sound, the traditional practice of placing adjacent pipes a major third apart was employed. However by the quality of its materials (although the case was contracted out by von Beckerath to the trade supplier, Heissler[207]), construction, and especially the good quality of touch, the organ made its mark.[208] As one Cambridge organ scholar commented, "It is very, very responsive" and "much more demanding in the way of getting the right touch."[209] Equally the "fullness and brilliance" of the organ was described by Glyn Jenkins as "foreign to most English organs."[210] The problems posed by a crisp and light touch clearly confounded players used to electric or electro-pneumatic actions; as the organ scholar quoted above said, most players "were slow to realize that they were in direct contact with the pipes, and not simply operating a switch."[211] The organ was inaugurated by Lionel Rogg on March 8, 1971, further recitals then being given by Peter Williams, Stephen Banfield and James Dalton.

While John Mander was training with von Beckerath, and working on the Clare College organ, his father, Noel, was continuing to move towards building organs in more classical style. During the mid- 1960's he had visited organs in Germany and Holland,[212] and in 1968, under the influence of Michael Gillingham, he built a seven-stop organ for the City Church of St. Michael, Paternoster Royal,[213] an essay in 'early English' style with GG long compass and without pedals. That such an instrument was built as early as 1968, at a time when the idea of style copies, as in Europe,[214] had barely reached England is remarkable. Mander also built a number of small positives,[215] and exhibited a two-manual organ at the 1971 St. Alban's Festival (built in his workshop by a German, Prengel, as his Master's examination organ, for which he was examined by August Späth of Freiburger Orgelbau).[216] Mander's largest organ was however that, of 1971, for St. Paul's Boys' School, London (a clear reply by the boys' school to the installation of the Grant, Degens and Bradbeer organ in St. Paul's Girls' School in 1970!). The St. Paul's Boys' School organ was the best mechanical-action organ built by Noel Mander. This said, the specification was a compromise between the clear logic of Frobenius and von Beckerath in Oxford and Cambridge, and the need for a 'liturgical' Salicional and an English 'full swell', with a reed 'chorus' at 16', 8' and 4'. How far the organ fell short of the artistry of Queen's is all too clear, though it must be said that, due to shortage of funds, the organ was completed in several stages.

St. Paul's Boys' School, London: Mander, 1971[217]

Great

Principal	8
Gedackt	8
Octave	4
Nason Flute	4
Block Flute	2
Sesquialtera II	2 2/3
Mixtur IV - VI	1 1/3
Trumpet	8

Swell

Rohr Flute	8
Salicional	8
Principal	4
Octave	2
Quint	1 1/3
Scharff IV	2/3
Regal	16
Cremona	8
Clarion	4
Tremulant	

Pedal

Subbass	16
Principal	8
Gedackt	8
Gemshorn	4
Rauschquint IV	2 2/3
Fagot	16

The scaling of the pipework (Table VII/8), was all on the narrow side - almost chamber organ scaling - perhaps a reflection of Mander's interest and experience in restoring old chamber organs, and the materials were a rather curious mixture, the pipework material varying from zinc basses and prospect, to 80% tin for the 2' and Mixture stops, including the Sesquialtera. The wind pressures, 57 mm for Great, and 63 mm for Swell and Pedal were relatively low. The wind was controlled by von Beckerath style in-built regulators (the design having been given to Mander by von Beckerath),[218] the voicing, except for the Salicional, open-foot and nick-free, and the organ was slide-tuned. The reeds were all by Stinkens, with a preponderance of short length in the bass - far from romantic swell reeds in make up. Overall the result tonally was a rather dry, emasculated organ. The touch, due in part to the use of wire cord trackers, and to the layout (partly enchambered with the Swell behind the Great), was spongy. The poorly proportioned box style 'case' and zinc prospect pipes, with the use of overlength, could not be compared with the Queen's College organ, or even with the box style case at Clare College, Cambridge. Whilst being a step forward for an English builder in 1971, the St. Paul's School organ remained almost devoid of character, perhaps inevitable from a builder who had shown no clear conviction of style aesthetic,

Table VII/8

St. Paul's (Boys) School	Great		WP 57mm

	C		c		c'		c''		c'''				
Principal 8' ϕ mw	140 1/4		76		48		29		18				Zinc bass remainder 55% tin
Gedackt 8' ϕ mw	100 1/4		55		31		21		14				55% tin
Octave 4' ϕ mw	70 1/4		41		26.5		17		10.2				55% tin
Nason 4' ϕ mw	63 1/4		43		27		16		9.5				55% tin
Block Flute 2' ϕ mw	64 1/5		45		27		18		13				80% tin 1:2 taper reducing to zero
Sesquialtera II 2⅔' ϕ mw	50 1/4		33		22		15		9.8				80% tin
Mixture IV-VI 1⅓' ϕ mw	32 1/4		19		11.3		6.7						80% tin
Trumpet 8' ϕ	102		up to	remainder									55%

Note: All voicing open-foot, nick-free, except Swell Salicional.
All pipes slide tuned.

Table VII/8

St Pauls (Boys) School	Swell		WP 63mm

	C		c		c'		c''		c'''				
RohrFlute 8' ϕ 1 mw	115 1/4		73		50		33.5		22				55% tin chimneys from c',
Chimney ϕ l	1/4 Twice ϕ												
Salicional 8' ϕ mw	95 1/4.5		58		32		22.4		16.2				Zinc bass remainder 55% tin. Foot regulated
Principal 4' ϕ mw	74 1/4		45.4		28		17		10.6				55% tin
Octave 2' ϕ mw	48 1/4		28		18.7		12.4		8.7				80% tin
Quint 1 1/3' ϕ mw	34 1/4		19.2		12.8		8.6		5.7				80% tin
Scharff IV 2/3' ϕ m	16 1/4		9.5		5.6		npta		npta				80% tin
Regal 16' ϕ	55		remainder		npta								55% 1/4 L Vox Humana construction with caps stinkens
Cremona 8' ϕ	45		remainder		npta								55% 1/2 L stinkens
Clarion 4' ϕ	75		remainder		npta								55% stinkens

Table VII/8

St. Paul's (Boys) School	Pedal		WP 63mm

	C		c		c'		
Subbass 16' ϕ mw	204 1/4		102		70		Zinc bass remainder 55% tin
Principal 8' ϕ mw	165		90		53		Zinc bass remainder 55% tin
Gedackt 8' ϕ mw	1/4						
Gemshorn 4' ϕ mw	75 1/4		49		32		55% tin 2:3 taper
Rauschquint IV 2 2/3' ϕ mw	54 1/4		32		19		80% tin
Fagot 16' ϕ	100		100		75		55% 1/2 L bass
		Mixture Compositions					
Mixture IV–VI c	1 1/3	1	2/3	1/2			
fs	2	1 1/3	1	2/3			
fs'	2 2/3	2	2	1 1/3	1		
f''	4	2 2/3	2 2/3	2	2	1 1/3	
Scharff IV C	2/3	1/2	1/3	1/4			
c	1	2/3	1/2	1/3			
c'	1 1/3	1	2/3	1/2			
gs'	2	1 1/3	1	2/3			
c''	2 2/3	2	1 1/3	1			
c'''	4	2 2/3	2	1 1/3			
Rauschquint IV C	2 2/3	2	1 1/3	1	throughout		

Source: Information given by Ian Bell of N.P. Mander.

in consultation with an adviser, Clutton, whose persistent attempt to build a 'universal', or 'multum-in-parvo' organ (an organ to play French music, both classical and romantic, German music, and to have a 'Full Swell'), runs through his writing in The Organ from the 1920's to 1980's.

Meanwhile, outside the establishment, Peter Collins was steadily consolidating his position as a builder committed to classical ideals. Following Shellingford he built a small four-stop positive[219] in 1969, which eventually went to Southampton University (the pipework of which was later incorporated into the three-manual organ by him in the Turner Sims Concert Hall of the University), followed in 1970 by two small two-manual organs, a practice organ for Dartington College[220] and one for St. Thomas' Roman Catholic Church, Darlington.[221] In 1971 he built a three-stop positive for Gordon Frier of Glasgow,[222] a four-stop positive for Reading University Music Department,[223] and a two-manual instrument (using much old material), for St. John's Presbyterian Church, New Barnet. The small new organs were reasonably successful, but the St. John's organ was less satisfactory, with a very poor horizontal placement giving rise to an indifferent key action.

1971 also saw the building of a new twelve-stop organ by Collins for the Church of the Holy Angels, Cranford. The church was a new, simple, rectangular, brick building with a good acoustic, and the organ was given an excellent position on the floor at the 'west' end. For this church Collins designed a simple rectangular case in mahogany, the Great prospect was derived from Frobenius organs in Scandinavia - a tripartite division with sharply rising pipe mouth lines contrasting with the falling line of the pipe tops. The Positive (Brustwerk) was behind hand operated folding doors - the first in England in recent times - and had an 'N' prospect, the 8' bass being hung upside down at the back of the box. The case was well proportioned both in itself and to the building.

Holy Angels Church, Cranford: Collins, 1971[224]

Great		Positive (Brustwerk)	
Principal	8	Rohr Flute	8
Wood Gedact	8	Koppel Flute	4
Octave	4	Principal	2
Gemshorn	2	Quinte	1 1/3
Mixture II-IV	1 1/3	Tremulant	
Tremulant			

Pedal	
Subbass	16
Fagot	16
Octave	8 (GT)

The specification was simple, two choruses, together with a 'Silbermann' style Pedal organ, Subbass 16' and Fagot 16'. The Great Principal 8' was also transmitted, Scandinavian style, on alternate grooves to the Pedal. The scales (Table VII/9), were all on the narrow side. The voicing, open-foot and un-nicked, was a little irregular, and the sound overall was rather 'Riegerish', and on the thin side. The action was centre-pivoted with backfalls for the Positive. Internally the mechanism was similar to Shellingford: there was still a great deal of free play, trackers were unregistered, and the design of the compensating beam did not keep the action in sufficient tension, again giving a spongy touch with the action rebounding against the keys. The chest had PVC sliders, spring loaded pipe seals, and aluminium pallets.[225] The wind supply was controlled by inbuilt regulators. The console set the style for many Collins organs, round-headed engraved knobs tapering to a square shank, and keys (made by Mornington and Weston), with rosewood naturals and 'skunk-tail' sharps in rosewood and ivory. Another Scandinavian detail was the use of friction, rather than hitch-down, foot levers for couplers.

The whole organ, if a little homespun, had a definite character, one clearly influenced by Rieger, Frobenius and Marcussen. (Collins had visited both Scandinavia and Southern Europe in the years following Shellingford.) Clearly a specific builder style was beginning to emerge; though modest, the Cranford organ placed Collins firmly as a builder to be reckoned with.

Holy Angels Cranford	Great	C-g'''	WP c. 60 mm

	C		c		c'		c''		c'''		g'''		
Principal 8' ø	135		79		48.5		29.5		18		14		1-31 in Copper in prospect remainder 75% tin
mw	103		65		41		26		16		12.5		
Wood Gedact 8' ø	80 × 100		51 × 64		32.5 × 40.5		30.5 × 27.5		13 × 18.5		10 × 15		
mw	1/4												
Octave 4' ø	76		45		27		16		9.5		7		75% tin Ears 1-36 Languid 70°
mw	63		37		22.5		13.5		8		6		
Gemshorn 2' ø	2/55		14/34		9/21.5		6/13.5		4/8.5		3/6		30% tin Ears 1-24 Languid 60°
mw.	1/4												
Mixture II-IV 1 1/3' ø	29.5		17.5		10.5		6		4		3		Languid 75°
mw	1/4												
1' ø	23.5		14		8.5		5		3		–		
mw	1/4												
2' ø	–		23.5		14		8.5		5		4		
mw	1/4												
2 2/3' ø					17.5		10.5		6		4.5		
mw	1/4												
4' ø										cs 8	6		
mw													

Holy Angels Cranford	Positive Brustwerk	C–g'''	WP c. 55mm

	C		c		c'		c''		c'''		g'''		
Rohr Flute 8' ϕ	80 × 100		60	fs 51 g 55	46		29.9		19		15		30% tin std 1–19 chimneys inside 20-30
mw			48	fs 40 g 43.5	37		24.5		16		13		
Chimney ϕ	1/4	graduating to			1/2								
L				g 82	71		51		36		30		
Koppel Flute 4' ϕ	65		43		29		18	g''' 7/14	6/12		4/8		30% tin 1–12 std. 1–12 tapered section of cannister 1/6 L, 1/3 ϕ. Open cannisters 1/2 ϕ, L 1/4 at 13 to 1/2 at 44 45–56 tapered
mw	51		34		23		15		10		7		
Principal 2' ϕ	41		24.5		14.5		8.5		5		4		75% tin Ears 1-24 Languid 70°
Quinte 1 1/3' ϕ	15/41		10.5/25.5		7.5/18.5		5/9.5		4/6		3/4.5		30% tin Ears 1-12 Languid 60°
mw	26		17		11		7		4.5		3.5		
			Pedal				C– f'			WP	c. 60mm		
Subbass 16' ϕ	135×170		80×100		57 × 64		32.5 × 40.5		20.5 × 27.5		13 × 18.5		Mahogany
mw	1/4												
cu	1/4												
Fagot 16' ϕ	75		58		44.5	f' 40							30% tin Half-soldered cap.
lower ϕ	20		17		14	13							
length	1850		1390		695	520							
Principal 8'	From		Great		Principal 8'								
			Mixture Composition										
Mixture II–IV C	1 1/3	1											
c	2	1 1/3	1										
cs'	2 2/3	2	1 1/3	1									
c'''	4	2 2/3	2	1 1/3									

Source: Scale sheets and other paper in Cranford file at P.D. Collins

In 1971 there were two other imported organs, a small 'box' positive by Flentrop for Swansea University[226] and a two-manual 'Salzburg' model organ by Rieger for St. Thomas' Roman Catholic Church, Walsall[227] (a gift to the parish from the Parish Priest, who had just won the football pools in spectacular manner!).

In November 1971 another influence furthering the building of classical organs was the formation of a Roman Catholic Organ advisory body, the Church Music Association Organ Advisory Group. Within the Church Music Association (a body established by the Catholic Hierarchy to develop liturgical music, under the direction of John Michael East), there had been continuous discussion over the matter of the parlous state of the organ in Catholic churches, mainly between John East, the writer, Dom Charles Watson (a monk of Prinknash, who had built two small organs[228] and written convincingly on <u>The Modern Classical Organ</u>),[229] and Nicholas Danby. Later Terence Duffy (Organist of Liverpool Roman Catholic Cathedral) and Andrew Williams were involved in the discussions. The writer had been responsible for the organ by ten Bruggencate at Woodley and, at the invitation of John East, had advised upon the Rieger organ for Walsall. After a number of meetings of the individuals mentioned above, a public meeting was held at Farm Street and a leaflet was put forward (and later agreed), as a basis for the advisory work of the Group. Unlike the Anglican Organs Advisory Committee recommendations (1954), this document, <u>Choosing an Organ</u>, established classical principles as the basis for design and advice from the outset, suggesting that:

> "The organ is a musical instrument and should always be a work of art. It should have an artistic appearance and produce a beautiful sound. Quality is more important than size. Some of the finest organs in the world are more than 200 years old. In the main, however simple or small, they have the following characteristics, as do the best of contemporary instruments:-
>
> a) An appropriate tonal and spatial disposition.
> b) Straight registers.
> c) Slider windchests.
> d) A light and responsive mechanical action.
> e) Appropriate casework and console.
>
> An organ for church use today should embody these characteristics...." 230

Though small, and in no way part of the 'establishment', the Group was to have considerable impact in the immediate years following its foundation, an impact greatly aided by the publication of a series of articles, from 1969 onwards, in the journal Church Music, discussing many new classical instruments, not just in England but throughout Europe, in Scandinavia, Holland, Germany, Austria and Switzerland.

The following years, 1972 and 1973, were to prove critical in terms of organ building in England. In 1972 R. H. Walker produced their most significant contribution to the classical movement, a nineteen-stop, two-manual organ in the Mitchell Hall, Aberdeen University.

Aberdeen University, Mitchell Hall: R. H. Walker (1972)[231]

Great		Front Positive (Brustwerk)	
Chimney Flute	8	Gedeckt	8
Principal	4	Rohrflöte	4
Twelfth	2 2/3	Principal	2
Wald Flute	2	Nasat	1 1/3
Tierce	1 3/5	Cymbel I	1/2
Larigot	1 1/3	Krummhorn	8
Twenty-second	1	Tremulant	
Trumpet-en-chamade	8		
Tremulant			

Pedal	
Subbass	16
Gedecktbass	8
Superoctave	4
Mixture II	2 2/3
Schalmei	4

For the Mitchell Hall a variety of builders was considered by Reginald Barrett-Ayres, Head of Music, the choice finally being made between J. W. Walker and R. H. Walker[232] (though it seems that Harpfer-Ermann were also considered).[233] Barrett-Ayres' concern was that the organ should have a "pleasing sound and musical balance."[234] The Organ Committee was "satisfied that the firm is motivated by the best principles in current organ design and is capable of building an

Table VII/10

Mitchell Hall Aberdeen	Great	C-g'''	WP 55mm

	C		c		c'		c''		c'''		g'''		
Chimney Flute 8' ϕ	117.5	Fs 87 G 69	68.5		39.5		25		16.5		13.4		55% tin Internal chimneys "thin metal"
Principal 4' ϕ	77		44.5		26.8		16.9		10		7.4		75% tin Made 4-5 notes larger than Queen's.
Twelfth 2⅔' ϕ	45.5		26.4		15.8		10		6.2		4.6		55% tin
Wald Flute 2' ϕ	53		32		20		12.75		10		7		75% tin
Tierce 1⅗' ϕ	33.5		19.6		11.8		7.5		4.6		3.4		75% tin
Larigot 1⅓' ϕ	25.6		14.8		9		5.7		3.5		2.6		75% tin
Sifflute 1' ϕ	28		17		10.5		6.5		4		2.6		75% tin
Trumpet 8'	npta												90% tin ½ U bass Harmonic treble

Table VII/10

Mitchell Hall Aberdeen	Front Positive	C-g'''	WP 50 mm

	C		c		c'		c''		c'''		g'''		
Gedeckt 8' ϕ	110	As 69.5	64		41		26.5		19		15.3		copper bass horizontal in top of box. From As 35% tin
Rohr Flute 4' ϕ	77		48		30.5		20	g'' 16 gs'' 12/19			9/12.5		55% tin
Principal 2' ϕ	45		26		16		10.5		7.2		5.5		75% tin
Nasat 1⅓' ϕ mw cu	39.2 1/5 "low"		23.5		14.8		9.5		6.4		5.1		55% tin
Cymbel I ½' ϕ	14.5		9.5	ds 8.6 e 12.2	9.4		6.2	f 5.4 fs 7.6	6.3		4.9		75% tin
Krummhorn 8' ϕ	npta												Copper

Mixture Composition

Cymbel I c e fs''	½ 1 2											

Table VII/10

Mitchell Hall Aberdeen	Pedal	C–f'	WP 60 mm

	C		c		c'		f'						
Subbass 16' ϕ	182	D 162	114		70		58						C, Cs inside case. D–G in flamed copper in prospect.
Gedecktbass 8' ϕ	103		63		38		32						35% tin
Superoctave 4' ϕ mw	72 1/4.5	Ds 62 E 62	43		26		21.5						C–Ds form outer two in each flat 75% tin
Mixture II 2 2/3' ϕ	68		40		25		20.5						75% tin
2' ϕ	41.5		24.5		14.6		11.8						75% tin
Schalmei 4' ϕ	npta												55% tin
			Mixture Composition										
Mixture c	2 2/3	2	throughout										

Source: Papers in the posession of Peter Walker and discussions with Peter Walker.

instrument of lasting value",[235] as well as noting that "the prices quoted by R. H. Walker would indicate better value than those quoted by J. W. Walker."[236] The estimate of R. H. Walker (Appendix F, 11), was thus accepted on June 4, 1971.[237]

The overall ethos of the organ was Scandinavian, in effect a 'Zachariassen' organ. Its whole shape and specification arose from the position in a small 'return' gallery at one end of the Hall. The height was such as to allow only for a 4' Great prospect above a 2' Brustwerk, with just six pipes of the Pedal Subbass 16', Ds-G, in the outer towers, the caps hidden by the shades. The extra case volume due to these pipes was also thought to be beneficial tonally. The asymmetric prospect (Appendix D, 47), by Peter Walker, derived from the non-symmetrical location coupled with some use of the natural progression from left to right/bass to treble. The outward swing of the upper cheek of the coving, necessary to house the pedal action, was similar to that at Queen's College. The Marcussen style en-chamade Trumpet, had a half-length bass and harmonic trebles, its breaks relating to the other pipe- and shade-breaks in the prospect. The asymmetry, within a two-tower symmetrical case, was a pleasing contribution to case design in Britain, having a certain charm arising from the unforced and logical relationships within the prospect.

The construction of the case was of chipboard and plywood panels hung on a steel frame, an attempt being made to gain more resonance from these materials by having relatively few fixing points. The tendency of steel frames to transmit action noise was obviated by the use of cork insulating pads at all points of contact. To cope with the extremes of temperature and humidity encountered in the hall, the wind chests were only fixed at the centre, halving the effects of any movement. The key action had centre-pivoted keys and employed metal squares (for lightness), and horizontal wooden trackers with fixed square beams, rather than backfalls. The stop action was a copy of that of the Queen's College - wire running in ball-bearings. The wind supply was controlled by in-built regulators employing both a parallelogram spring and two harmonium springs. Tonally the organ was a deliberate attempt to emulate the sound of the Queen's College Frobenius organ, which had been examined in some detail by Peter Walker. The

Front Positive was effectively identical with the organ for St. Benedict's Roman Catholic Church, Drumchapel,[238] at the express wish of members of the University Music Department, who had been much taken by that organ. The Trumpet, winded from the front of the bar, was seen as part of the Great chorus, and not as a fanfare trumpet for University ceremonial occasions.[239]

The stoplist appears a little strange, with its individual ranks of upperwork. The provision of these was to give maximum versatility in terms of teaching, though Peter Walker would have preferred a Mixture on the Great.[240] The Pedal organ, on two chests in the towers on either side of the Great, had originally been intended to have a Fagot 16' but lack of finance prevented this. Flue pipes were from Stinkens and the reeds from Giesecke. The scales, by Peter Walker (Table VII/10), were empirical, but based around observation of the Queen's College organ.[241] Mouth treatment was straightforward, around 1/4 mouth width and 1/4 cut up, with narrower mouths for the Nasat 1 1/3' (1/5), and Superoctave 4' (2/9). The voicing was without nicks and with open feet, though the Chimney Flute 8' was unusual in that it had a high arched mouth in late romantic style. The tendency to lack of blend, evident in the organ, is perhaps due to the mix of narrow and wide scales, e.g. Wald Flute, Larigot and Sifflute as chorus registers, as well as to the ranks being on separate slides. At the same time the final tonal finishing of the organ (as in the case of the other positives by Peter Walker) somehow lacks a certain personality, though the attempt to produce a clear singing organ, an anglicised Scandinavian organ (clearly shown in Peter Walker's detailed description of the voicing process (Appendix F, 12)), was laudable, as was the deliberate aim for quality through using contemporary materials. The organ was perhaps as important for what it emulated, the 'Scandinavian' style, as for what it was, an organ whose voicing, and hence musicality, did not somehow match its thoughtful design philosophy.[242]

The difficulty experienced by Peter Walker in making his organs pay (the Mitchell Hall organ cost the University £17,227 and lost the firm £1,000),[243] coupled with the problem in England of working with a less-than-fully-skilled work force, and small budgets, led to his ceasing to build further organs, though a number of partly built positives remained in his workshop.[244] This withdrawal of a builder committed to mechanical-action, encased organs, who was not only able to write cogently on the organ, as shown by his articles in The Musical Times[245] and The Organ Year Book,[246] but was able to demonstrate clear thinking in design, as demonstrated in the Mitchell Hall organ, was a loss to English organ building. At the same time the distance English organ building had to travel to reach the quality achieved at the Queen's College was all too clear.

The provision of a small mobile positive for the platform at the opposite end of the Mitchell Hall is also a matter for note in its implicit rejection, by the Music Department, of the 'detached console' philosophy, and acceptance of differing musical usage for the two organs.

Declining fortunes were also evident at Grant, Degens and Bradbeer. 1972 was the last year in which more than one mechanical-action organ was built; these were a practice organ for Martin Neary,[247] a large three-manual, thirty-two stop organ for Woodford Parish Church, and an ingenious two-manual organ for Dunchurch.

St. Mary's Church, Woodford: Grant, Degens and Bradbeer, 1972[248]

Hauptwerk		Schwellwerk	
Prinzipal	8	Gedackt	8
Rohrflöte	8	Salicional	8
Oktave	4	Vox Angelica	8
Spitzflöte	4	Prinzipal	4
Oktave	2	Nasat	2 2/3
Mixtur IV	1 1/3	Gedacktflöte	2
Cornet V	8	Scharff IV	1
Trompete	8	Fagott	16
Tremulant		Hautbois	8
		Tremulant	

Brustwerk		Pedal	
Holzgedackt	8	Subbass	16
Spitzgedackt	4	Oktave	8
Prinzipal	2	Grossgedackt	8
Sifflöte	1 1/3	Koppelflöte	4
Sesquialtera	2 2/3	Nachthorn	2
Zimbel III	1/2	Mixtur IV	2 2/3
Krummhorn	8	Posaune	16
Tremulant		Schalmei	4

Table VII/11

Woodford	Hauptwerk	C–g'''	WP 60 mm

	C		c		c'		c''		c'''		g'''		
Prinzipal 8' φ	135		81		48·1		30·1		17		12·2		70% tin strikens Languid 70°
mw	1/4												
cu	1/4												
Rohrflöte 8' φ	108		71		42		26		18		14·5		50% tin GDB (Brentford)
mw	? 1/4												
cu	? 1/3·5												
Octave 4' φ	78·3		41·5		27·4		18·7		10·3		7·2		50% tin GDB (Brentford)
mw	1/4												
cu	1/4												
Spitzflöte 4' φ	108		64·3		39·5		25·1		13·9		9		50% tin GDB (Br.) 5:8 taper Languid 70°
mw	1/4·5												
cu	1/4												
Octave 2' φ	42·5		25·9		16		10·5		6·1		4·5		50% tin GDB (Br) Languid 70°
mw	1/4												
cu	1/4												
Mixture IV 1 1/3' φ	30		18		10·3		6·7		4·5		3·4		50% tin GDB (Br)
mw	1/4												
cu	1/4												
1' φ	24		14·4		8·9		5		3·5		2·9		50% tin GDB (Br).
mw	1/4												
mh	1/4												
Cornet V 8' φ				g 50	41·75		27		17·5		16·2		Mounted on own chest behind prospect 8' as Rohrflöte remainder open
1 mw													
4' φ				44	36·25		22·6		14·2		13·2		50% tin GDB (Br)
2 2/3 φ				36·5	31		21·5		14·9				Values not given npfd.
2' φ				30									
1 3/5 φ				27									
Trompete 8' φ	90		66·5		52·2		43·7		38·6		36·8		50% tin GDB (Br) German shallots ? Killinger

Table VII/11

Woodford	Schwellwerk	C–g'''	WP 57 mm

	C		c		c'		c''		c'''		g'''		
Gedackt 8' ϕ mw cu	90 1/4 1/3.5		57		36.6		24.8		17.5		15.1		Zinc bass and 50% tin GDB(Br)
Salicional 8' ϕ	–	G 70	56.9		35.3		21.9		14.1		10.9		Zinc and 50% tin GDB(Br)
Vox Angelica 8' ϕ	52.5		32.5		20.5		13.3						50% tin GDB(Br)
Prinzipal 4' ϕ mw cu	75.2 1/4 1/4		46.1		28		17.5		11.4		9.1		70% tin GDB(Br) Languid 70°
Nasat 2 2/3' ϕ mw cu	58 1/4.5 1/4		35.5		22		13.5		9.5		8.1		1-36 50% tin 37-56 65% tin GDB(Br) 2:3 taper
Gedacktflöte 2' ϕ mw cu	35 1/4 1/3.5		21.5		13.3		8.3	g'' 6.5 gs'' 7 gs'' 1/4.5 gs'' 1/4	6.1		5		50% tin 1-44 std. 45-56 1:2 taper GDB(Br)
Scharff IV 1' ϕ mw	18.5 Unisons		11.2 1/4,	Quints	7	1/4.5	4.6		3.2		2.7		50% tin GDB(Br)
Fagott 16' ϕ	70		55		35		26		21.5		19.8		50% tin Giesecke
Hautbois 8' ϕ	76		65		48		35		32		31		c.25% tin Conical ? Killinger shallot K.17.

Note: ten Bruggencate's notes on scale charts indicates –
Fagott 16' as "Dulzian.... voicing full, yet hollow and warm" and
Hautbois 8' as "French voicing, fresh, singing, little biting"

Woodford	Brustwerk	C–g'''	WP 51 mm

	C		c		c'		c''		c'''		g'''		
Holzgedackt 8' ϕ	80x63		remainder		Npta								Cedar GDB (Northampton)
Spitzgedackt 4' ϕ mw cu	90 ? 1/4 ? 1/3.5		55		34.1		20.4	9'' 14.1 9s'' 14	11		8.5		Std. bass (Ged.) open from 9s'', 1/2 taper 50% tin GDB (Br)
Prinzipal 2' ϕ	40.5		25.8		16		10		6.4		5		50% tin GDB (Br)
Sifflöte 1 1/3' ϕ mw cu	35 1/4.5 1/3.5		20		12.3		7.8		5.2		4.3		50% tin GDB (Br) Languid 70°
Sesquialtera II 1 1/3–2 2/3' ϕ mw cu	25.6 1/4.5 1/4	B 16.2	25.4		15.7		10.1		6.7		5.1		50% tin Languid 70°
Sesquialtera II 4/5–1 3/5' ϕ mw cu	21.4 1/4 1/4	13 13.8	21.4		13.3		8.3		5.1		4		50% tin Languid 70°
Zimbel III 1/2' ϕ	14.3		remainder		npta								50% tin GDB (Br)
Krummhorn 8' ϕ	13		13		11		11		12		12		"Copy of Queen's College"

Table VII/11

Woodford	Pedal	C–f′	WP 76 mm

	C	c	c′	f′	
Subbass 16′ ϕ	216x 166	remainder npta			Secondhand register ex Davies (Northampton)
Oktave 8′ ϕ	135	83	50	40	Copper and 70% tin stinkens
Grossgedackt 8′ ϕ	122	75	44.3	37.3	50% tin
Koppelflöte 4′ ϕ	107	63	38	31.2	50% tin GDB
Nachthorn 2′ ϕ	67	41	26	23	50% tin GDB
Mixtur IV 2 2/3′ ϕ	52	31.7	19	17	50% tin GDB
mw	Unisons 1/4, Quints 1/4.5				
cu	1/4				
Posaune 16′ ϕ	152	110	80		Zinc and 50% tin. French shallots ? Killinger No 9 shape made by GDB
Schalmey 4′ ϕ	65	52	40		50% tin German shallots ? Killinger 30 ~~shape~~ shape but made by GDB
Tower ϕ	32	27	21		

Table VII/11

Woodford	Mixture Compositions		

Stop	Note					Remarks
Mixture IV	C	1⅓	1	⅔	½	
	c	2	1⅓	1	⅔	
	c'	2⅔	2	1⅓	1	
	c''	4	2⅔	2	1⅓	
Scharff IV	C	1	⅔	½	⅓	
	c	1⅓	1	⅔	½	
	c'	2	1⅓	1	⅔	
	c''	2⅔	2	1⅓	1	
	c'''	4	2⅔	2	1⅓	
Sesquialtera II	C	1⅓	4/5			
	c	2⅔	2			
Zimbel III	C	½	⅓	¼		(Finally installed with breaks at
	c	⅔	½	⅓		C G d a e' b' g'')
	c'	1	⅔	½		
	c''	1⅓	1	⅔		
	c'''	2	1⅓	1		
Pedal Mixture IV	C	2⅔	2	1⅓	1	throughout

Source: Scale sheets and charts in ten Bruggencate's hand at GDB, Northampton, papers in GDB files, and a letter from John Bailey 17:8:82

As the scale charts (Table VII/11), and working drawings (Appendix D, 48, 49), show, the Woodford organ was essentially designed, scaled and voiced by ten Bruggencate. The overall ethos was north-German, with Hauptwerk 8', Oberwerk (Swell) 4', and Brustwerk 2', but the firm's forceful tonal tradition was tempered a little by ten Bruggencate's Dutch-Swiss influence. The scales, by ten Bruggencate, were derived from Metzler's practice.[249] There was a romantic bias in the Swell, with its strings and 'full swell' reed chorus (though initially the 16' reed basis was to be a Dulzian 16', a Fagot was installed) and a nod towards early English and French practice was evident in the provision of a mounted Cornet in the Great. Architecturally the organ was clearly derived from Scandinavian practice in its use of prospect groupings in thirds in Pedal and Great. It was unusual in being an early example in England of an organ placed behind the altar. The Swell, an Oberwerk above the Great and within the overall rectangular case, is perhaps one of the most satisfactory solutions within the classical movement to the placement of a substantial swell division.

Alongside Woodford was development of the scheme for Dunchurch. This was a carefully conceived attempt on the part of Forsyth-Grant and Grant, Degens and Bradbeer to produce a two-manual and pedal 'standard' organ - useful, versatile and economic. As a preliminary Forsyth-Grant initiated discussions with a number of players including Hurford, Weir and Danby,[250] and a series of discussion papers[251] were circulated. The intention was "to provide a Specification that will play most of the genuine Organ Classics, both North European and French."[252]

The evolution of the specification is clear in the discussion papers and was summarised by Forsyth-Grant:

> "I think it is important when one considers the Specification of a small organ of this type that first of all one should put down on paper all the desired Stops, and then distribute them over the two Manuals and Pedals as best one can, bearing in mind the tonal requirements of the literature." 253

St. Peter's Church, Dunchurch: Grant, Degens and Bradbeer, 1972[254]

Manual 1 (Great)

Rohrflöte	8
Principal	4
Waldflöte	2
Cornet II	2 2/3
Mixtur IV	1 1/3
Tremulant	

Manual 11 (Brustwerk)

Gedackt	8
Spitzgedackt	4
Principal	2
Quintflöte	1 1/3
Krummhorn	8

Pedal

Subbass	16
Octave	8
Quintade	4
Fagot	16

The final stop-list was logical, almost a miniature Queen's College disposition (the Krummhorn was in fact a copy of the Queen's College stop),[255] though the use of a Principal 8' on the Pedal alone (unlike similar sized organs by Marcussen, where the Principal 8' is duplexed on Great and Pedal), whilst demonstrating a firm adherence to an 8', 4', 2' Werkprinzip disposition, was perhaps a little wasteful. Nevertheless at a cost of around £5,000[256] the organ offered a great deal.

A report was made by ten Bruggencate and John Bailey, at the time of the planning of Woodford and the standard organs, on visits to the main trade suppliers in Europe in June 1971 (Appendix F, 15) and, as the estimate (Appendix F, 16), for the 'standard' organ shows, this report was largely acted on, except that the metal pipes (other than the Krummhorn, by Laukhuff), were bought from Klein, the latter having been recommended by ten Bruggencate. The estimate is a remarkable document summarising, as it does, the buying-in practice and costs in 1971. It is also the only such detailed document to come to light in this study.

The most unusual feature of the organ construction was the use of chests by Lötzerich, "made of a special resin-bonded ply- and glass-reinforced resin (including pallets), making the entire chest apart from the pallet cover boil-proof."[257] The asymmetric case design, described by Birley as /beautifully clean and unfussy",[258] appears to have emerged from discussion within Grant, Degens and Bradbeer.[259] The straightforward

Table VII/12

Dunchurch	Great	C – g'''	

	C		c		c'		c''		c'''		g'''		
Rohrflöte 8' ϕ	106	B 68	62		39		26		18.5		15.4		60% tin Klein
mw	1/4												
cu	1/3.5												
Chimney ϕ	-		12		8.2		5.5		4.7		4.3		
l	-		72		49.2		33		28.2		25.8		
Principal 4' ϕ	79		46.3		26		16		10		7.8		80% tin Klein
mw	1/4												
cu	1/4												
Waldflöte 2' ϕ	59		36.2		22		13.8		8.6		6.9		40% tin Klein
mw	1/4.25												
cu	1/5												
Cornet II 2 2/3' ϕ	87		52		31		18.7		10.9		8.2		30% tin 1:2 taper Klein
mw	1/4.25												
cu	1/5												
Cornet II 1 3/5' ϕ	56.5		34.5		21		12.5		7.3		5.6		40% tin 1:2 taper Klein
mw	1/4.25												
cu	1/5												
Mixture IV 1 1/3' ϕ	28		16.8		10.2		6.3		4.2		3.3		? 80% tin Klein
mw	Unison ranks			1/4,	Quint ranks			1/4.5					

Table VII/12

Dunchurch	Brustwerk	C–g'''	

	C	c	c'	c''	c'''	g'''	Notes
Gedackt 8' ϕ	90 x 61	64 x 39	42 x 23	28 x 16	19 x 7.5		GDB (Northampton) spruce
cu	29	19	11	7	4		
Spitzgedackt 4' ϕ	80	47.8	28.8	17.5	11.1	8.7	60% tin 2:3 taper Klein
mw	1/4						
cu	1/3.5						
Prinzipal 2' ϕ	44	26.8	16.1	9.9	6	4.7	80% tin Klein
mw	1/4						
cu	1/4						
Quintflöte 1 1/3' ϕ	37	22.8	14.4	9.2	6.3	5.0	60% tin Klein
mw	1/5						
cu	1/3						
Krummhorn 8' ϕ	13	13	11	11	12	12	Laukhuff "Copy of Queen's" 60% tin
		Pedal		C–f'			
Subbass 16' ϕ	175 x 140	115 x 93	72 x 58				spruce Kimber Allen
cu	50	35	21				
Octave 8' ϕ	135	81.5	49				Copper Laukhuff
mw	1/4						
cu	1/4						
Fagot 16'	npta						Giesecke from GDB stock

Source: Papers by ten Bruggencate in posession of Dominic Gwynn, Northampton.

centre-pivoted, floating backfall action layout was, as the drawing shows, largely by John Bailey[260] (Appendix D, 52). The scales (Table VII/12), as in the case of Woodford, were by ten Bruggencate,[261] and appear to demonstrate ten Bruggencate's Metzler-derived practice. The pipework was pre-voiced in Germany, and finished on site by ten Bruggencate and John Bailey.[262] Overall the Dunchurch or 'Standard' organ, and Woodford, were convincing entities. As Birley wrote of the Dunchurch organ "It combines in a remarkable way truly contemporary virtues and traditional classical qualities. It is as clean and alive in appearance as it is in tone colour. It is economical as it is adequate."[263] The effective loss to English organ building of Grant, Degens and Bradbeer, after Woodford and Dunchurch, left a vacuum which no builder in the country was able to fill.

As to the work of other builders in 1972, the largest, Mander, built a positive for the workshop and a two-manual organ for St. Matthews', East Croydon,[264] the layout of which appears based on the Queen Elizabeth Hall organ, which was maintained by Mander. The small family firm of Johnson, encouraged by Donald Wright, built three organs in the north-east, a box organ for Millbourne,[265] a six-stop, one-manual for Windynook,[266] and also a thirteen-stop, two-manual organ for Ponteland.[267] Though the small box organs of Johnson were acceptable, the larger Ponteland organ was, as Donald Wright indicated,[268] less satisfactory, having a heavy touch, "forceful - even strident and rough"[269] tonal qualities, and weak case architecture.[270] Of the younger builders Collins continued to consolidate his position with a number of box organs,[271] and a house organ for Sheila Lawrence.[272]

Two other builders also entered the classical field in 1972, Nigel Church of Stamfordham and Peter Hindmarsh of Cardiff. Church, a young man, took over the old, and undistinguished, firm of Blackett and Howden and commenced building mechanical-action organs. His first three, in 1972, were a positive in his workshop,[273] a ten-stop house organ for David Parkes in Gateshead[274] (later placed in Swallowfield Church, Berks), and a twelve-stop practice organ for the University of Salford.[275] Unpretentious and lacking in finesse though these organs were, they did give Nigel Church a foothold in classical building. In Cardiff, in a small workshop at his home, Hindmarsh completed a three-stop box organ[276] (later placed in Westminster Cathedral Lady Chapel). Though tiny, this was unquestionably a very beautiful small organ, in musical and craft terms. It was used for continuo playing and attracted the attention of Peter Pears, who, in conjunction with Benjamin Britten, commissioned a further small organ for the Maltings Concert Hall, Aldeburgh, from Hindmarsh.[277]

1973 saw the completion of a number of organs by Collins. Following the house organ for Sheila Lawrence, another was built for Geoffrey Parker.[278] Its design showed clear Scandinavian influence, having a typical Frobenius prospect, five flats in fourths, and with an Italian style "Tromboncini" in between the feet of the prospect pipes.[279] The specification was ingenious as was the compass, C-c'''', allowing varied registration and practice of much of the repertoire, the action, though spongy, was acceptable and reliable, the voicing refined, and the overall finish good. Collins next built a batch of four 'standard' organs.[280] His work however took on a larger scale again with the building of a two-manual organ for St. Silas, Byker,[281] with Donald Wright as consultant. The organ was a small <u>Werkprinzip</u> instrument, with a 4' Great, 2' <u>Brustwerk</u> and 8' Pedal, in many ways resembling Cranford. The box style case was well proportioned but lacking any feel of solidity (Appendix E, 30). Tonally the organ was pleasing, but mechanically it was not always reliable.[282]

Following Byker, Collins, with James Dalton as adviser, built a three-manual organ (albeit with only a Regal 8' on the third keyboard) for Brasenose College, Oxford. In 1970 the College had received a gift of £20,000 for a new organ from Maurice Plateneaur and, at the suggestion of Dalton, the Chaplain, Leslie Styler, approached Collins to build the organ.[283] One reason for the choice of Collins was his anticipated relatively short completion time, a matter appealing to the Chaplain, who was soon to retire and who wished to see the organ installed within the benefactor's lifetime.[284] The Chaplain stipulated that the existing Jackson case was to be retained.[285] The stoplist was drawn up by Dalton and Collins. The layout within the old case, the chests Regal, Swell, Pedal and Great, one behind the other, running at right angles to the prospect, with the console at the side, was not sound and, with hindsight, it is not surprising that the organ gave trouble.

The problems began with the later delivery of the organ, since, it would seem, Collins was still working at Cranford.[286] By June 1973, however, the organ was installed. The specification was:

Brasenose College, Oxford: Collins, 1973[287]

Great		Swell	
Principal	8	Wood Gedackt	8
Rohrflute	8	Principal	4
Octave	4	Rohrflute	4
Spitzflute	4	Nazard	2 2/3
Octave	2	Gemshorn	2
Mixture IV	1 1/3	Tierce	1 3/5
		Sifflöte	1
		Oboe	8
Manual III		**Pedal**	
Regal	8	Subbass	16
		Octave	8
		Gedackt	8
		Spitzoctave	4
		Fagot	16
		Trumpet	8

During the Michaelmas Term of 1973 the organ gave continuous trouble[288] and Dalton reported, in December 1973, that there was "a good deal of detailed work to be done... the action uneven and unreliable," and that there was "ample evidence of rough workmanship."[289] The College then withheld final payment, and Collins in turn was reluctant to attend to the organ because of this.[290] A small amount of work was then done by Collins,[291] but Dalton wrote again to the Bursar to the effect that: "the detailed and painstaking work necessary to the proper completion of the organ has not been satisfactorily carried out."[292] By the end of February 1974 Collins wrote to the Bursar indicating that "the survival of our small unit of craftsmen, which is somewhat unique in this country, is now in grave difficulties because of the withholding of payment."[293]

The organ continued to prove unreliable and the Organ Scholar, Paul Koronka, who had sent the Bursar a critical report in the Michaelmas Term, sent a second condemnatory report.[294] Collins in turn blamed the problems on overheating the Chapel, and was concerned at unauthorized interference with the organ.[295] In April the Bursar called in ten Bruggencate to make an "unbiased factual report."[296] He gave a condemmatory report indicating that "insufficient attention has been paid to detail from the design stage onwards,"[297] and detailed deficiencies in design and execution in virtually all areas of the organ.

Meanwhile Collins was pressing for payment and suggested two assessors, Herbert Norman and Frank Bradbeer. These the College rejected and in turn proposed a panel of three assessors, one each from the College and Collins, and a Chairman nominated by the Royal College of Music, with terms of reference to take evidence and determine whether:

> "the organ built and installed in the Chapel of Brasenose College by P. D. Collins conforms to the specification," 298

and whether:

> "the standard of performance of the organ is that normally to be expected" 299

and to note any deficiencies. The College nominated Simon Preston; Collins, Bradbeer; and the Royal College of Music, Francis Jackson.[300] Collins then issued proceedings against the College for £5,600 outstanding[301] and went back on his agreement to submit the dispute to the panel.[302]

The College decided to call for further expert opinion and approached Forsyth-Grant, who refused and suggested Peter Walker, who, in turn, refused to be involved.[303] The College then approached the Incorporated Society of Organ Builders, who recommended Henry Willis. He, however, visited the College prior to his acceptance, in company with Collins, the College then became suspicious that Willis was not independent,[304] and he was therefore firmly rejected by the College. The next approach was to Frobenius, who declined. Finally, the College approached Flentrop, who responded to the effect that:

> "It could be in writing such a report for you may help to come to a settlement with Mr. Collins, being satisfactory to both parties. If mistakes have been

> made by the builder, they should be acknowledged by him. If the unsatisfactory results of the organ are due to circumstances for which the builder may not be responsible, this should be acknowledged by Brasenose College." 305

Belatedly the College also received a report from Francis Jackson which concluded: "One's general impression is of a poor instrument, badly finished, lacking inspiration and thus offering no incentive to the player."[306]

On 25th November, 1975, Dirk Flentrop inspected the organ, with Peter Collins present. His report,[307] received on 18th December, 1975, was a comprehensive five-page, document, which concluded that, "In general the organ is a well made instrument," but "despite this the organ has not come out as a satisfactory instrument."

Flentrop's reasons were that the organ had "too large a stoplist" for the case, which should "not have had more than 12 stops" in it, and that the action "is not well regulated", continuing:

> "This uneveness and irregularity is partly due to the fact that Mr. Collins did not allow himself to give sufficient time to do this work correctly. The complicated layout of the instrument, caused by the oversized stoplist in relation to the available space of the organ case, makes every irregularity more noticeable."

He then went on to discuss all aspects of the organ in detail, indicating that the winding, windchests, stop action and pipework were of good materials, but that the:

> "Voicing of flue pipes could have had more attention. The sound of the flue pipes is acceptable, however it is not the kind of sound which gives the satisfaction you find in some of the finest organs."

He also criticised the voicing and lack of blend of the reeds. Having considered the organ, he then proceeded to indicate his criteria for judgement:

"I went to Shellingford.... This organ has served as an example of Mr. Collins' craftmanship. After representatives of Brasenose College have seen and played this organ, the decision was made to have the new Brasenose College organ made by Collins.

Thus the Brasenose College organ should not be compared with the work of other organ builders and certainly not by the work of famous builders of the past or of today, but should only be compared with the Shellingford organ being acceptable to Brasenose College at the time the order for a new organ was given.

In general.... the quality of both organs are the same with the following exception that at Brasenose the pipe materials were better than Shellingford but that the voicing of the Brasenose reeds is far below the results of Shellingford."

Flentrop continued:

"The main difference between the organs is the design.

"Brasenose: interior design and layout leads to difficulties in the action, leads to problems in the voicing.

"Shellingford: completely new... good co-ordination between the front design, size of organ case and necessary space for the interior. Therefore the action is more easy to adjust, the voicing less problematic and gives better results.

"The main difficulty at Brasenose is that Mr. Collins, at the moment he made the design, was too eager to make a too complete and too sizeable organ. He did what he could in the choice of materials to make it successful. He even made new tin front pipes at the chapelside of the organ to demonstrate that the interior pipes were of the same high quality. That he did not succeed to make an organ to satisfy Brasenose College is also due to the fact that Brasenose expected an organ far better than Shellingford, because of the growing experience of Mr. Collins.

"Mr. Collins fell into the trap, in which several organ builders fell before him, the trap of making too large an organ in the available space. It is a pity that Brasenose's representatives could not make this clear to Mr. Collins before accepting his design."

Flentrop recommended that Collins:

> "Give his utmost attention to a careful adjustment of the action, so that all components stay in line, stay in the right position.
>
> "Give some more attention to the voicing of the flue pipes.
>
> "Replace the reed pipes by pipes of similar construction and made by the same reed pipe-maker as the Shellingford organ.
>
> "Voice the reed pipes with painstaking thoroughness."

and that the College should pay Collins "a considerable amount direct after his acceptance of the report."

A more constructive, fair and objective report would be hard to find. In March 1976 Collins and the College entered into a supplementary agreement to deal with the matters raised by Flentrop, the College contributing an additional £1,000 towards the cost of the new reeds,[308] and on 18th March, 1977, Dalton wrote to the Bursar "I agree that payment should now be made."

Returning from the conclusion of the Brasenose episode, in 1977, to 1973, it was in that year that the much heralded and advertised organ for Mold Parish Church was completed by Alistair Rushworth, of Rushworth and Dreaper. Alistair Rushworth, son of James Rushworth, spent some three and a half years in his father's workshop, then fifteen months with Flentrop, and fifteen months with Casavant.[309] Whilst the advance publicity perhaps led to people's expectations being too high, the organ was not unsuccessful overall, and was in particular very successful in architectural terms. Parts of the case of the old choir organ (as at Brasenose, by Jackson)[310] were sympathetically re-used, the organ being sited in a shallow case in the easternmost bay of the north side of the church. Without doubt it is one of the most satisfying solutions yet achieved in a long narrow medieval English Parish Church. The specification, simple and logical, was drawn up by the Organist, Geoffrey Knowles, and Alistair Rushworth:[311]

Mold Parish Church: Rushworth and Dreaper, 1973[312]

Great

Principal	8
Chimney Flute	8
Octave	4
Wald Flute	4
Tapered Flute	2
Mixture IV	1 1/3
Trumpet	8

Swell (Brustwerk)

Stopped Flute	8
Principal	4
Gemshorn	2
Larigot	1 1/3
Mixture III	2/3
Krummhorn	8
Tremulant	

Pedal

Subbass	16
Octave	8
Choral Bass	4
Nachthorn	2
Fagot	16

The layout was a standard Werkprinzip one. As the drawing (Appendix D, 53), shows, in the side towers stand the 8' Pedal Octave from C-A; the Great Principal 8' is in the centre tower and flats except for the two lowest notes which are placed inside the case on either side of the Swell box. The Great soundboard is severely constrained by the chancel arch, and is hardly any larger than the Swell soundboard. The only minor matter for comment, in relation to the specification, is the provision of two tapered 2' stops, Tapered Flute on the Great, and Gemshorn on the Swell. As Higginbottom suggested, it would perhaps have been better to "have foregone the option of the 2' Flute on the Great in order to characterize the principal chorus more strongly with a straightforward Fifteenth."[313] Tonally the organ was described as having "sweetness of tone", "discretion," and being "more Dutch, even English, than North German,"[314] though Higginbottom went on to suggest a dichotomy between the tonal character, and specification and layout, the latter two encouraging "one to play above all the North European repertoire from Sweelinck to Bach."[315]

The action, described by Higginbottom as "excellent", though not as "deliciously responsive" as that of the Kern organ in Notre-Dame-des-Blancs-Monteaux in Paris,[316] was centre-pivoted, with compensation through floating backfalls (Appendix D, 53). Sayer, however, does point out that the Swell action, with its horizontal run, gives a

Table VII/13

Mold	Great	C-g'''	WP 60 mm

	C		c		c'		c''		c'''		g'''		
Principal 8' ϕ	148		84		50		32		19		14		1–25 92% tin
mw	1/4												26-56 70% tin
cu	27		16.5										
Chimney Flute 8' ϕ	136		92		55		40		26		19		45% tin
mw	1/4												
cu	36.5		20		11.5		7		4.75		3		
Chimney ϕ	1/4												
L	1/4												
Octave 4' ϕ	84		48		30		19		12		9		70% tin
mw	1/4												
cu	16		10		5.5		3.5		2		1.5		
Wald Flute 4' ϕ	100		68		46		32		21		15		30% tin 1:2 taper
mw	1/4												
cu	21.5		13		8.5		5		3		1.8		
Tapered Flute 2' ϕ	138.5		93.4		62.75		42.25		28.4		22.6		30% tin 1:2 taper
mw	1/4		1/4		1/4		1/4.5		1/5		1/5		
cu	8		npta		3.5		2.5		1.5		1		
Mixture IV 1 1/3' ϕ	npta												70% tin
mw	1/4												
cu	1/5												
Trumpet 8' ϕ	98	B 75	92		69		56		47		47		1/2 L C-B 60% tin "thin tongues"

Mold	Swell	C–g'''	WP 55mm

	C	c	c'	c''	c'''	g'''	
Stopped Flute 8' ϕ	114	71	46	32	22	17	45% tin
mw	1/4						
cu	25	15	10	6.5	4	npta	
Principal 4' ϕ	77	46	29	18	11	8	70% tin
mw	1/4						
cu	16	9.5	6	3.5	2	1.5	
Gemshorn 2' ϕ	npta						45% tin 1:4 taper
mw	1/4.5						
cu	4.5	5	3.5	2	1	0.5	
Larigot 1⅓' ϕ	npta						30% tin
mw	1/5						
cu	7.5	5	3	2	1	0.5	
Mixture III ⅔' ϕ	npta						70% tin
mw	1/5						
cu	1/5						
Krummhorn 8' ϕ	38	35	32	28	26	25	"Dom Bedos" shallots, 1/4 Lin bass 70% tin

Mold	Pedal	C-f'	WP 65mm.

	C		c		c'		c''		c'''		g'''		
Subbass 16' ϕ	npta												Wood standard Rushworth wood scale
Octave 8' ϕ	155		92		55		44						1–13 92% tin
mw	1/4												14-30
cu	?27		18		10		8.5						70% tin
Choral Bass 4' ϕ	88		52		32		25						70% tin
mw	1/4												
cu	17		10		6		5						
Nachthorn 2' ϕ	npta												30% tin
mw	npta												"wide scale, low cu, small mw"
cu	12		8		5.5		4.5						
Fagot 16' ϕ	131		96		75		67						1/2 C conical 68% tin ('Bedos' shallots
Mixture Compositions													
Mixture IV C	1 1/3	1	2/3	1/2									
B	2	1 1/3	1	2/3									
as	2 2/3	2	1 1/3	1									
a'	4	2 2/3	2	1 1/3									
gs''	8	4	2 2/3	2									
Mixture III C	2/3	1/2	1/3										
A	1	2/3	1/2										
fs	1 1/3	1	2/3										
ds'	2	1 1/3	1										
c''	2 2/3	2	1 1/3										
a''	4	2 2/3	2										

Source: MSS in private posession.

"feeling of springiness"[317] unlike the Great, which "feels positive and direct."[318] Achieving this quality of action does not appear to have been straightforward for Rushworths: Michael Butler, who voiced the organ, described it as being almost "built twice" in the workshop.[319]

An unusually detailed description of Rushworth's design process is given by Sayer, derived from discussion between him and Rushworth:[320]

> "His method is first to draw up the list of stops for each keyboard, and, in relation to the size and acoustic parameters of the building, select the wind pressure and pipe scales to be used. From these... it is possible... to calculate the maximum flow of air through each open pallet and hence to calculate the pallet size... for each note, although in practice the maximum size for each octave is sufficient. From pallet sizes and pipe diameters the soundboard dimensions are then calculated; the static force (or 'pluck') on each key to open its pallet is also calculated and measurements on the finished organ show a very close correlation to these theoretical values. Since the Manual keys and all levers in the mechanical action are made with approximately a 1:1 force ratio, the force felt at the key is, allowing for minimum friction, only fractionally more than that at the pallet... The trackers were of cedar and registered in graphited frames." 321

The stop action was electrical. As Higginbottom commented "It would be a bold builder indeed who constructed an organ for use in the anglican liturgy without some electrical gadget or other."[322] The wind supply was from the blower via a small reservoir on top of the blower, in the base of the case, to inbuilt regulators in which the diaphragm is "pressed down by the wind pressure and balanced by the upward force of a controlling spring; should the pressure fall, the diaphragm will rise and open a pallet valve admitting wind from the blower and thus maintain a constant pressure within the chest, finely adjustable by spring tension. This simple feed back - loop system ensures near absolute pressure stability."[323]

The scales are given in Table VII/13, and have been described by Alistair Rushworth in the following terms:

> "Great Organ. The Principal chorus at 8 ft., and 4 ft., and Mixture is based on a scale slightly smaller than... Normal mensur, but increasing slightly in the trebles to give breadth of tone. The Flutes at 8 ft., 4 ft., and 2 ft., are not as wide as might be expected in the bass, but... wider in the middle and treble.... The Trumpet is based on Dom Bedos style shallots with average scale resonators.
>
> "Swell Organ. The Swell is... a natural progression of the Great... and the scales are... progressively smaller.... the 8 ft. Flute has narrow basses increasing in the middle and treble, there is brilliance from the 2 ft. Gemshorn... with the 4 ft. Principal being scaled down from the Great Principal choruses. This therefore has smaller scales to balance... the Principal chorus and the Larigot is narrower than usual so... not being too ponderous over the 2 ft. Gemshorn. The Krummhorn... is based on Dom Bedos style shallots and scales.
>
> "Pedal Organ. With so few stops to choose from to get a resourceful chorus the scales were based on... Normalmensur. The Choral Bass is a natural progression of the 8 ft. The Subbass was... standard wood scale and the Nachthorn has broad scaling with low cut-ups and small mouths.... The Fagot 16 ft. is tapered... and... based on Dom Bedos scales." 324

The scales, as also the action, appear to have been derived largely from the practice of Phelps: the scale sheets show the Great Principal, Chimney Flute, Octave, Wald Flute and Tapered Flute; the Swell Stopped Flute, Principal and Gemshorn; and the Pedal Subbass, Octave and Choral Bass to be derived from the Casavant organ in Nashville, and the Krummhorn to be derived from the Casavant organ in St. Pascal, Kamouraska.[325] The reeds, described by Alistair Rushworth as having "Dom Bédos" shallots, had, in fact, deep 'U'-shaped, parallel shallots, of Phelps design, which Phelps referred to as his "Dom Bedos shallot."[326] The reeds all had relatively thin tongues,[327] and the flue voicing was open-foot and flue-regulated.[328]

Whether the Mold organ was, "a rediscovery of the English tradition evolved in the 18th century and carried to maturity by people like Hill in the 19th,"[329] as Sayer suggested, is questionable. Rather the organ is shown to be one in which the sensitive handling of old case material, in conjunction with practices gained mostly from Phelps, resulted in an organ with perceptible if, as Higginbottom implied, slightly ambivalent character.

Although Mold was indeed an advance for English organ building, the demise of many firms continued in 1973. No such organs were built by Willis and R. H. Walker, and J. W. Walker produced their last mechanical-action organ from the Ruislip workshop, a small positive for Egdean.[330] 1973 also saw the last mechanical-action organs of Noel Mander, prior to the return of his son. These were a positive for Bramber Church,[331] and a two-manual organ, exhibited at St. Alban's (and later placed in Hampstead).[332] This was a 'skinny' box design, with 4' Hauptwerk and 2' Rückpositiv, the latter placed on the floor behind the player's stool. Tonally it was a lifeless organ. Hill, Norman and Beard built their last tracker organ[333] under the management of Herbert Norman and his son John, for Horsell. It was a visually ill-proportioned organ with a 'heavy' foot and stolid prospect. It marked the end of a long period of compromise and indecision in design terms. Grant, Degens and Bradbeer made just one instrument, a practice organ for Anthony Burns-Cox.[334] The 1973 St. Albans Festival saw the use of a two-manual organ by Kenneth Jones,[335] later installed in a house in Hitchin.[336] This would seem to have been built (as also another organ by Jones exhibited at the 1973 Festival) to Jones' design by Pennells and Sharpe, with pipes from Rogers.[337] Another organ also built under sub-contract by Pennells and Sharpe was that designed and voiced by Dennis Thurlow for the Roman Catholic Church at East Grinstead.[338]

Against this background the work of Collins was remarkable, and demonstrates the conviction he carried. Despite the problems of the Brasenose organ (and perhaps to some extent the cause of some of them), the production of Collins in 1973 and 1974 was considerable, being no less than ten mechanical-action organs totalling some 111 stops. Just how considerable an output this was can be seen by comparing it with the comparable work of other 'established' builders in the same two years: Hill, Norman and Beard (1 organ, 11 stops); R. H. Walker (1 organ, 5 stops); Mander (2 organs, 13 stops); Grant, Degens and Bradbeer (1 organ, 4 stops); J. W. Walker (1 organ, 3 stops); Rushworth and Dreaper (1 organ, 18 stops); Johnson (1 organ, 5 stops); in total 59 stops, just over half Collins' output. It is also staggering that Collins built almost twice as many organs in 1973 and 1974 as the total of imported organs and a virtually identical number of stops.[339] Under this pressure of work, and with a staff of about seven young men, it is hardly surprising that the building of the Brasenose and Byker organs should give rise to problems of quality of work.

Overall, in the early 1970's, however, the loss of interest on the part of Forsyth-Grant; the mechanical unreliability (and late delivery) of Collins, the vacillation of ten Bruggencate, in and out of Grant, Degens and Bradbeer; and the lack of commitment, or experience, on the part of other builders; all led to a clear disaffection for the quality of English classical organ building (the only English alternatives remaining being 'rebuilds', or extension organs). This disaffection was accelerated by the growth in travel to Europe by many players and advisers, including, as Thistlethwaite wrote, "organists whose musicianship and musical perception was regarded as exemplary,"[340] giving them experience of organ building in central Europe. At the same time there was a steady growth in the availability of long-playing recordings of new and historic classical organs in Europe. The inevitable result of all these experiences was the importation of a number of organs in 1973 and 1974 (1972 being the last year in the 1970's when no imported organs entered the country). In 1973 seven organs, four of fair size, were imported from Europe; St. Mary, Nottingham (Marcussen), Eton School (Flentrop), Clifton Roman Catholic Cathedral (Rieger), The Royal Northern College of Music at Manchester (Hradetzky), Nottingham German Church (von Beckerath), St. Ives Roman Catholic Church (Rieger), and one by van Vulpen for James Dalton in Oxford. The St. Ives Rieger[341] and Nottingham von Beckerath[342] instruments were small positives, the van Vulpen[343] a six-stop practice organ.

The four larger organs were of much greater significance, and not just in terms of size. Coming as they did from Denmark, Holland and Austria, these organs showed no common allegiance to a specific builder or style. Each was in a distinct position of significance, the Marcussen in a major Anglican parish church, the Flentrop in one of England's premier public schools, the Hradetzky in a major musical teaching institution, and the Rieger in a new, albeit Roman Catholic, cathedral. There could be no dismissing the arrival of these organs as the work of some lone eccentric, or academic in an ivory tower: all had arrived independently. Further, their qualities were such that they could not be ignored: for example the Organist's Review, a very conservative, indeed staid journal, carried reviews of the Clifton[344] and the Manchester[345] organs within a few months of their installation. These four imported organs must therefore be given some consideration.

The Eton organ was based on a case and some pipework, mainly the prospect pipes, of an organ by Mittenreiter dating from 1773. This organ originated from the English Church in Amsterdam and was given to Eton in 1914. Until 1972 it had formed the centrepiece of a large four-manual Willis/Lewis organ.[346] On advice from Peter Hurford, who was consultant, the College authorities decided to restore the Mittenreiter organ, and to discard the remaining Willis/Lewis material – a quite remarkable step in an establishment where the 'English tradition' of persistent rebuilding might well have occurred. The result of the restoration by Flentrop was an organ of much charm and character.

School Hall, Eton: Mittenreiter (1773)/Flentrop (1973)[347]

Hoofdwerk		Rugwerk	
Bourdon	16	Gedekt	8
Prestant	8	Prestant	4
Holpijp	8	Fluit	4
Fluit	4	Gemshoorn	2
Octaaf	4	Larigot	1 1/3
Quint	2 2/3	Dulciaan	8
Octaaf	2	Tremulant	
Cornet III			
Mixtuur IV			
Trompet	8		
Tremulant			

Pedal	
Bourdon	16
Prestant	8
Gedekt	8
Octaaf	4
Fagot	16

The specification was largely Mittenreiter,[348] with the Pedal Bourdon, Prestant, and lower octave of the Gedeckt shared with the Hoofdwerk; a Fagot 16' was also placed on the pedal. The beauty of this organ, with its excellent tonal and mechanical qualities, was brought to the notice of a wider public by a very fine recording made on the organ by Hurford in 1974.[349] Despite this there has never been a review of this organ in the musical press. The organ was also one of the earliest organs to be tuned in an unequal temperament (Werckmeister III),[350] in recent years, being preceded only by the tuning of the restored 1790 Samuel Green organ, in the Queen's Private Chapel in Buckingham Palace, to an unequal temperament by John Norman, in 1961.[351]

While the Eton organ was, in a sense, a restoration, the Marcussen organ in Nottingham Parish Church and Rieger organ in Clifton Cathedral were new. They were of similar size, twenty-five and twenty-six stops respectively. Both had a clear classical layout, the Marcussen a two-manual organ with 8' Hauptwerk and 4' Brustwerk, with the Pedal at the rear; the Rieger a three-manual instrument with 16' Pedal in a single tower, 8' Hauptwerk, 4' Rückpositiv (actually a side-positive), and 2' Brustwerk. The Marcussen case was a traditional three-tower design with mildly contemporary architectural detail, the Rieger a contemporary free-standing sculpture developed from hexagons derived from the hexagonal grid of the new Cathedral, and from the triangular shapes of sound reflectors on the roof of the Cathedral.

The differing liturgical requirements account for much of the difference between the two organs. In terms of the Anglican liturgy the demand for a Swell Organ (Brustwerk) with at least one string stop and reeds, albeit merely Krummhorn and Vox Humana at 16' and 8' pitch, to provide a 'full Swell', led to the Marcussen Brustwerk having nine registers, leaving only sufficient registers for an adequate Hauptwerk and Pedal.[352]

At Clifton the demands of the post-Vatican II liturgy were quite different, the need for terraced dynamics to accompany responsorial music (between cantor, or choir, and congregation), led to the provision of a three-manual organ, giving ease of movement between three dynamic levels,[353] a matter totally misunderstood by Higginbottom in his review of the organ.[354] At Clifton there was also the 'psychological' demand for a Cathedral to have a three-manual organ!

Clifton Roman Catholic Cathedral, Bristol: Rieger, 1973[355]

Hauptwerk		Rückpositiv	
Principal	8	Metallgedackt	8
Rohrflöte	8	Principal	4
Octav	4	Koppelflöte	4
Sesquialter II	2 2/3	Gemshorn	2
Superoctav	2	Quintlein	1 1/3
Mixture IV-VI	1 1/3	Scharff IV	2/3
Trompete	8	Krummhorn	8
		Tremulant	

Brustwerk (Swell)		Pedal	
Holzgedackt	8	Principal	16
Rohrflöte	4	Octav	8
Nassat	2 2/3	Subbass	8
Principal	2	Fagott	16
Terz	1 3/5	Schalmei	4
Cimbel II	1/2		
Regal	16		
Tremulant			

The problems posed by the hexagonal modular basis of the Cathedral were considerable, though these were not the only problems. Before the design was proceeded with a number of hurdles had to be overcome by the writer and other members of the Organ Advisory Group, including the abandoning of a scheme dating from 1968 (and already contracted for with Daniels), to remove the old, undistinguished, organ by Vowles, from the pro-Cathedral into the new building[356] - a settlement was however agreed. The old organ was to have been placed on a concrete shelf and hidden by a screen. The shelf, (the provision of which had been due to the architect's observation and measurements of the shelf for the Walker organ in All Saints, Clifton, only a hundred yards from the site of the new Cathedral), which had already been built, was at such a height that it was impossible to place a well designed organ either on it or below it, as the early sketches show (Appendix D, 54a). There was much heated discussion with the Cathedral architect over the shelf but it was finally taken down when Glatter-Götz paid for its removal.[357]

Clifton Cathedral	Hauptwerk	C–g'''	WP 60mm

	C		c		c'		c''		c'''		g'''		
Principal 8' φ	155		80		48		27.5		17		12.9		As Meiringen
mw	112		62.5		36.3		22		13.7		10.4		75% tin
Rohrflöte 8' φ	130		72		42		27		19		15.5		25% tin
mw	94		1/4		1/4		1/4		1/4		1/4		
Chimney φ			15.5		10.7		8.1		7		6.5		
l			170		86		48		32		23		
Octave 4' φ	83		46		26		16.3		10.7		8.5		75% tin
mw	1/4												
Superoctave 2' φ	44		25.2		16.6		10.3		7.4		6.3		75% tin
mw	1/4												
Sesquialtera II 2 2/3 φ	55	B 36	43		28.3		19.3		15.2		9.7		50% tin
mw	1/4	1/4	27.4		19		13.4		9.4		6.7		
Chimney φ	11	9											
l	110	72											
1 3/5' φ	48		32.5		21		14.3		8.5		5.7		50% tin
mw	29.2		19		13.4		9.3		5.9		4.2		
Mixture IV–VI 1 1/3' φ		G 30	25.2		15.5		8.8		6.3		4.6		75% tin
mw	1/4												As Meiringen
	Doubled ranks			+	2HT	mw	1/4						
Trompete 8' φ	110		85		68		56		47		44		75% tin
lower φ	15		12.5		10.5		9		8.5		8		German shallots

Clifton Cathedral	Rückpositiv	C-g'''	WP 55mm

	C		c		c'		c''		c'''		g'''		
Metallgedackt 8' ϕ	125		71		43		28		19		15		50% tin and 75% in prospect
mw	90		53		34		1/4		1/4		1/4		
Prinzipal 4' ϕ	86		46		25		15		9.8		7.8		75% tin
mw	67		35		1/4		1/4		1/4		1/4		
Koppelflöte 4' ϕ	74		52.5		35.5		23		13.1	as''' 13.7	10.1		50% tin C-F std. c'''s conical
mw	1/4		1/4		1/4		1/4		1/4	1/4.5	1/4.5		
Cone ϕ	20		17.7		14.1		11		6.3				
L	232		164		82		41		20.6				
Gemshorn 2' ϕ	24/48		15.5/31		8/17.8		6.5/12.6		4.6/8.8		4/6.8		50% tin
mw	35.4		21.6		13.7		9.1		6.4		5		
Quintlein 1 1/3' ϕ	39		25.8		15.6		9		5.2		4		50% tin As Altach
mw	21.6		13.7		9.5		6.6		1/4		1/4		
Scharff IV 1' ϕ	24.5		14.5		9		6.3		4.4				75% tin As Charles City, USA, Hw.
mw	1/4												
	Doubled		ranks		— 2HT								
Krummhorn 8' ϕ	32		29		27		25		23		npta		50% tin In "the old French style."

Table VII/14

Clifton Cathedral	Brustwerk Swell	C–g'''	WP 50 mm

	C		c		c'		c''		c'''		g'''		
Holzgedact 8' ⌀	96x70		55x40		34x24		22.5x16.3		15x11.5		11.5x9.5		Wood As Marienstatt
Holzrohrflöte 4' ⌀	68x54		39x31.		26x21		16x13		11x8.7	cs''' 12.6x8.3	10x6.7		cs''' upwards open
Chimney ⌀ L	15 136		10 78		7.5 52		5.3 32		4.4 22				
Nasat 2⅔' ⌀ mw	52.5 41.3		35.6 25.8	b 23 17.4	27.5 16.6		15.6 10.7		9.7 7		7.4 5.2		C–b std. 50% tin
Holzprinzipal 2' ⌀	37x29		24x18		13.7x11.3		9.3x7.3		6.7x5.3		5.2x4.2		As Marienstatt
Terz 1⅗' ⌀ mw	44.2 25.7		27.5 15.9		17.8 10.7		12 7.5		7.8 4.8		5.5 3.6		50% tin As Dulliken + IHT
Cimbel II ½' ⌀ mw	14.3 1/4		8.1		5.5		4						
Holzregal 16' ⌀	17	Gs 16		e 15		c's 14							For details see Appendix B II.

Clifton Cathedral	Pedal	C-f'	WP 70 mm

	C		c		c'		f'						
Principal 16' ϕ	270		149		85								
mw	197		114		66.6								
Octave 8' ϕ	149		85		52.5		44						
mw	114		66.6		39.8		34						
Subbass 8' ϕ	119×94		74×58		npta								
Fagot 16' ϕ	150		105		81		72						Wooden shallots
lower ϕ	22		18		16		15						
Schalmey 4' ϕ	75		65		56		54						

Clifton Cathedral	Mixture Compositions		

Mixture IV–VI C	1 1/3	1	2/3	1/2								
c	2	1 1/3	1	2/3								
gs	2 2/3	2	1 1/3	1	2/3							
ds′	2 2/3	2	1 1/3	1	1							
gs′	2 2/3	2	1 1/3	1 1/3	1							
ds″	4	2 2/3	2	2	1 1/3	1 1/3						
gs″	4	2 2/3	2 2/3	2	2	1 1/3						
ds‴	4	4	2 2/3	2 2/3	2	2						
Scharff IV C	2/3	1/2	1/3	1/4								
c	2/3	1/2	1/2	1/3								
f	1 1/3	1	2/3	1/2								
c′	1 1/3	1	1	2/3								
f′	2 2/3	2	1 1/3	1								
f″	4	2 2/3	2	1 1/3								
c‴	4	2 2/3	2 2/3	2								
Cymbel II C	1/3	1/4										
Gs	1/2	1/3										
e	2/3	1/2										
c′	1	2/3										
gs′	1 1/3	1										
e″	2	1 1/3										
c‴	2 2/3	2										

Source: Rieger scale sheets (in G. Lhôte's hand) n.d.

Initially estimates from Daniels; Grant, Degens and Bradbeer; Pels; and Rieger were considered, but the opinion that Glatter-Götz was the only builder with the architectural, mechanical, musical and personal flair to match up to providing an organ for the Cathedral prevailed. The nave organ by Rieger in Freiburg Cathedral was again an influence in England, in that the Cathedral clergy were much impressed by a scheme of visual distinctiveness and modernity, and the architect was satisfied because the organ was composed of part-hexagons.

The use of hexagonal forms was not however entirely helpful to the organ design. The Hauptwerk and Rückpositiv cases, especially the latter, have far too great a volume in relation to the pipework, whereas the Pedal and Brustwerk are both far too cramped, giving rise to tuning problems. Space in the Pedal tower was so restricted as to preclude a Subbass 16', hence, (as at Steinkirchen and Doetinchem) the disposition of a Principal as the only 16' flue stop on the organ. The structural problems of the weight of the Pedal division, and especially the Principal 16', in the cantilevered Pedal tower were not entirely satisfactorily coped with by being 'hung' (as was the Rückpositiv), by steel wire from the main case and, as a result of sag, recourse was made to relieving this by the use of further steel wires attached to the Cathedral ceiling. The structural problems were exacerbated by the case materials, which included veneered and edged blockboard panels that tended to compress under pressure.

Despite the hexagons, the action, as the drawings show (Appendix D, 55, 56), was very simple. The Rückpositiv and Pedal chests lie at an angle of 30° from the keyboards: the key action was therefore transmitted simply via two squares for Hauptwerk, Rückpositiv and Pedal, and via backfalls to the Brustwerk. The trackers and squares were of wood and rollers were of aluminium, with bushed bearings. The action was compensated, using floating beams with pneumatic motors. The chests were of plywood with telescopic seals and mahogany top boards. Each windchest had its own inbuilt regulator, the pressure maintained by a parallellogram spring. The tremulants were operated by decreasing the surface of the regulator periodically so that the spring tension rises, giving a periodic increase in pressure.[358] The scaling and mixture composition (Table VII/14) was by Georges Lhôte (as can be seen from the shop scale sheets in his hand, (Appendix F, 18)), his 'French' influence warming the overall 'northern' ethos of the organ. The success of the scaling was remarkable in that both scaling and pipe-making had to be done before the Cathedral was sufficiently complete to enable an assessment of the acoustic, though acoustic predictions for the Cathedral were available.[359] The voicing was by a Rieger employee, Pflüger.

Higginbottom found the organ "a superb instrument in its own right,"[360] but criticised it for a dynamic range which commenced too high and, in effect, for its inability to cope with accompanying the Anglican repertoire; his review was followed by much correspondence in subsequent issues of the Organists' Review by Clutton,[361] Hunter,[362] Norman[363] and others. Clutton inveighed against those who "get a package deal (case and all) from one of the North German-school builders"[364] and invoked "patriotism" in relation to the then English balance of payments deficit as a reason for not importing foreign organs. His partisanship is also demonstrated in the same letter in his continuing advocacy of Mander. Clutton also commented that "the Clifton organ is grotesquely wasteful in design. Apart from its liturgical shortcomings it is clearly incapable of playing French music of any period."[365] As to French music, quite apart from the overall French influence of Lhôte on the scales in general, the Positive Krummhorn was, as stated on the scale sheets, "nach altfranzösisch Vorbild"![366] The inadequacy of Clutton's thought in relation to "liturgical" shortcomings was clearly demonstrated by Hunter.[367]

Such inadequacy as the organ may have stems more from three other factors: the position of the organ; the fact that the organ had to be built whilst the Cathedral was being finished (building work was still going on on the day of the opening!); and the case materials. The position of the organ, determined by one of the hexagons on the floor plan grid, is too recessive in relation to the main body of the Cathedral. Its proximity to the outside walls, coupled with the inevitable chest placement, causes the sound, especially of Pedal and Rückpositiv, to 'run' round the perimeter of the building. The building of the organ prior to completion of the Cathedral was the least of several evils. As the organ file and the contract show, the Cathedral Administrator was solely concerned to have an organ, any organ, in by the opening. Initial discussions commenced on April 10, 1972,[368] the contract (Appendix F, 17), was signed on October 27th, 1972, and completion was to be by May 1st, 1973. Completion was in fact June 28th, 1973, the day before the opening of the Cathedral, the delay being due entirely to building works in the Cathedral. The speed of construction, five weeks in the workshop, one week to erect, and three weeks to voice, coupled with the over-economic form of construction, both in framing and panelling (inevitable at a cost of £18,000), was not conducive to the finest of results. Nor was (and is) the effect on the organ of the continuous shedding of concrete dust from the walls of the Cathedral entirely helpful.

The Marcussen organ in St. Mary's, Nottingham, considered by Butterworth as having "potential as a medium for the North European Baroque school, but also in its overall ability and versatility",[369] and described by Downes as "a very fine instrument... excellent"[370] is very much a typical Marcussen organ of the period, other than in the use of a relatively large 4' Brustwerk.

St. Mary's Church, Nottingham: Marcussen, 1973[371]

Great		Swell (Brustwerk)	
Principal	8	Gedakt	8
Rørfløte	8	Spidsgamba	8
Oktav	4	Principal	4
Spidsfløte	4	Kobbelfløte	4
Nasat	2 2/3	Gemshorn	2
Oktav	2	Quint	1 1/3
Ters	1 3/5	Scharff V-VI	
Mixtur VI-VIII		Krummhorn	16
Trompet	8	Vox Humana	8
		Tremulant	

Pedal	
Subbass	16
Oktav	8
Gedakt (From Subbass)	8
Oktav	4
Mixtur VI	
Fagot	16
Trompet	8

The key action, however, whilst very positive, is heavier, deeper and far less crisp than that of the Rieger organ at Clifton, and does not perhaps entirely merit the description 'sensitive' attributed to it by Downes.[372] Architecturally the organ does not sit quite happily in the medieval church, perched a little uneasily on a west-facing gallery in the south transept, and uncertain as to whether it belongs to nave or choir. Downes' view over the appearance was clearly expressed: "Dear! dear! dear! where were the architects, the antiquarians and the advisories"[373] - seemingly a thinly veiled reference to the Anglican Organ Advisory Committee!

Despite these reservations, the organs at Nottingham and Clifton were of considerable significance in demonstrating that classical solutions could be found to differing liturgical need without loss of musical integrity, or wasteful expenditure. As Butterworth wrote of the Marcussen organ: such an organ "demonstrates perfectly the economy of money and space which can be attained through skilful design and voicing by first-class craftsmen."[374] The Marcussen organ cost £20,200, "about half of the estimated sum required to rebuild the existing pneumatic organ."[375]

Musical integrity was clearly of paramount importance when it came to the installation of a large (indeed the largest to date) classical organ in Britain, in the Royal Northern College of Music. Yet sheer size brought its own problems and dangers. Given some eighteen to twenty-five stops, a clear discipline is imposed if the essential factors of chorus work, mutations, and reeds are all to be present. Fifty-one stops, as at Manchester, could easily lead to an eclectic organ lacking musical coherence, attempting much, but in specific terms achieving little.

The Hradetzky organ, for which Geraint Jones was consultant,[376] was laid out as a <u>Werkprinzip</u> organ, both in terms of specification and placements; 16' Pedal Organ, 8' Great, 4' <u>Positiv</u>, and with a Swell Organ at 8' Principal pitch, but romantically coloured in terms of strings and reeds.

Royal Northern College of Music, Manchester: Hradetzky, 1973[377]

Great

Quintadena	16
Principal	8
Rohrgedackt	8
Octave	4
Hohlflute	4
Octave	2
Blockflute	2
Mixture VI-VIII	2
Cymbale IV	2/3
Cornet IV-V	8
Fagotto	16
Trompette	8
Clarion	4

Swell

Principal	8
Flute	8
Viola da Gamba	8
Voix Céleste	8 (from C)
Prestant	4
Flauto Traverso	4
Doublette	2
Mixture VI-VIII	1 1/3
Cornet V	8 (from g)
Bombarde	16
Trompette	8
Oboe	8
Voix Humaine	8
Clarion	4
Tremulant	

Positiv

Gedackt	8
Principal	4
Rohrflute	4
Nazard	2 2/3
Octave	2
Waldflute	2
Tierce	1 3/5
Larigot	1 1/3
Scharff IV	1
Cymbale III	1/2
Cromorne	8
Tremulant	

Pedal

Principal	16
Subbass	16
Principal	8
Gemshorn	8
Octave	4
Flute	4
Nachthorn	2
Rauschquint III	2 2/3
Mixture IV	2
Posaune	16
Trompette	8
Trumpet	8
Schalmey	4

The physical placement is dramatic and simple, if a little insecure visually,[378] even "precarious,"[379] being an asymmetric arrangement of rectangular cases growing from the narrow base of the console. The Pedal is placed to the left, Great to the right, Positiv projecting well forward above, and a little to the left, of the console with the Swell above the Positiv and between the Pedal and Great organs. All the divisions thus speak freely into the concert hall.

The specification was essentially North German in structure, with concessions to French romanticism in the Swell, and French classicism in the Positiv. As Higginbottom indicated,[380] the organ had clear principals, mellow flutes and a variety of characteristic reeds, from an "almost decadently smooth Swell Oboe"[381] to a bucolic or "full-blooded"[382] Positiv Cromorne. The provision of two groups, Great and Swell, of chorus reeds at 16', 8' and 4' pitches, was a marked feature of the organ. The touch, whilst acceptable, was not distinguished for its lightness or responsiveness, the Swell action coming in for some criticism.[383] Overall Higginbottom regarded the organ as possessing "both the quality and coherence to do any genuine musical argument full justice".[384] Despite his comments, and the qualities indicated above, the organ seems to lack a definable character: it is not just that "it might not produce all the historically appropriate tone colours - les timbres justes,"[385] but that perhaps so large an organ in so small a hall (with a less than sympathetic acoustic, in which there is too much direct sound for the intensity of more than a few stops to be used at a time),[386] has forced certain restraints upon the builder. There could thus be justification for Williams' comment that because of its lack of stylistic or historic orientation, the importation of such an organ "could prove counter-productive."[387]

In many ways 1973 was thus a turning point in English organ building. The demise, or at least eclipse, of builders such as Hill, Norman and Beard, J. W. Walker, R. H. Walker and Grant, Degens and Bradbeer, coupled with the rise of younger builders such as Collins, Johnson, Church and Hindmarsh, the return of the young Alistair Rushworth and John Mander to their respective firms, ten Bruggencate re-establishing himself in his own right, Thurlow emerging from the fading fortunes of J. W. Walker, and the appearance of Jones, all made for a somewhat unstable situation. As Thistlethwaite wrote, "it must be regarded as (at the least) dubious to imply that the craft and trade here is in a healthy condition: on the contrary, it may well be that a considerable amount of (self-administered) surgery is going to be needed."[388] The establishment builders appeared to lack artistic credibility and vision, while the young builders were in many ways little tried and experienced. The artistic reasons for the employment of builders such as Flentrop, Rieger, Marcussen and Hradetzky are all too clear, but financial arguments were also compelling: the twenty-six stop, three-manual Rieger organ for Clifton Cathedral, costing £18,000, was surprisingly inexpensive and compared with the eighteen-stop two-manual Rushworth organ at Mold, built in the same year and costing £16,000, appears the bargain of the decade.

The years 1974 and 1975 saw both development and regression. Collins' work showed evidence of both. The organ for Worksop Priory, (1974)[389] a large two-manual organ, was an instance of Collins again over-reaching himself. The organ was said to give considerable trouble mechanically[390] (a matter not helped by a leaking and damp east wall), and tonally it was perhaps the most aggressive instrument built by Collins. The forceful, driving sound was due in part to the organ having to carry from the extreme east wall of the church, through choir and crossing and down an exceedingly long nave, and in part to Collins' determination to build a 'large' organ. Clearly the Priory choir, first in line from the organ, were going to feel, and did feel, overwhelmed, resulting in the choir moving into the nave! Also, with David Butterworth as consultant, comparison with the excellence of the Marcussen organs in Nottingham was inevitable - especially when it was found by Butterworth that Collins had been unable to place the bass of the 32' Pedal Sordun on the chest within the case and had, without authority, placed it out of sight on the top of the swell box![391] The prospect of the organ,[392] derived again from the 'Scandinavian style' of Frobenius, with Great and Pedal placed either side of the Swell, was not unpleasing, though the horizontal element, caused by keeping the roof of the case below the base of the east window, was too dominant.

By contrast, with the building of the sixteen-stop organ for St. Martin's College, Lancaster,[393] in 1974 (an organ following directly in the 'Byker' style), Collins began to gain more security and reliability in terms of action, though this security was not total, as the small box organs built in 1975 for the Universities of Nottingham, Norwich and Aberystwyth[394] appeared to show.[395] These were a combination of two box positives standing on a base in which the pedal section was laid horizontally. Though these box organs could be demounted for continuo playing, their complex construction gave rise to problems. Another small organ by Collins was for Hutton Rudby Parish Church in 1975.[396]

By 1974 ten Bruggencate had left Grant, Degens and Bradbeer and was again in business on his own account, building a three-stop positive for the Roman Catholic Chapel at Besford Court,[397] and a one-manual and pedal organ for the Roman Catholic Church at Haverfordwest.[398] This latter had the same specification as his earlier organ for Woodley Catholic Church (8', 4', 2', 1 1/3', 1' /16'), but the case was very different, the manual stops being placed in Rückpositiv position on the gallery rail (the first such instrument in recent times in Britain), and the Pedal Subbass 16' laid horizontally on the gallery floor to the side of the organ. The style of the manual case (Appendix D, 57) was derived from those of the 'Schnitger' school, and was very similar to the Rückpositiv of the 1713 Marienhafe organ by von Holy.[399] Its distinction caused Peter Williams to write that "Bruggencate's perfect little Schnitger case in Haverfordwest seems to me ideal."[400] Tonally the organ proved equally satisfying, with a pronounced Dutch flavour, mellow flutes and comparatively mild, singing principals.

Continuing to work on a small scale was Peter Hindmarsh in Cardiff. In 1974 he completed a five-stop organ for The Maltings,[401] and began work on two six-stop organs for Catholic Churches in West Byfleet[402] and Poulton-le-Fylde.[403] His inability to work other than slowly led to these instruments not being completed until 1978. Despite the small-scale approach of Hindmarsh (and due also perhaps to his personal financial circumstances not appearing to require him to work in a commercial manner), his individual quality and artistry were clearly evident.

Another individual builder to appear on the English scene in 1974 was William Drake, who had worked and trained under Rudolph Janke in Göttingen, and who qualified as a Master Organ Builder in Germany.[404] Drake settled at Buckfastleigh working both on his own account, and in conjunction with Dartington College and the Loosemore Centre (established in 1975 by John Wellingham, of Dartington College, for the study of early keyboard music and instruments). Though marked by a similar small-scale, unhurried, approach to that of Hindmarsh, Drake brought a more professional element to his work, and at the Loosemore Centre he completed a small two-manual organ,[405] a convincing instrument much in the style of Janke.

At the same time Nigel Church was showing steady development. Following the completion of two simple one-manual and pedal organs for St. Paul's Walden[406] and Pin Green,[407] he built a nineteen-stop, two-manual organ at Winlaton.[408] In this he was encouraged and aided by the Reverend David Parkes, as consultant. Tonally and mechanically it was not particularly distinguished, architecturally it was more satisfying, having an attractive asymmetry. It also coped well with the demand for a Swell organ in a Werkprinzip context by placing it in Oberwerk position, with part of the Pedal Principal 8' and Gemshorn 4' in prospect, in front of the swell shutters. The importance of the Winlaton organ is indicated by the fact that it was the third largest mechanical-action organ built in England by a native builder during 1974, and that it was completed in a year that saw zero production of mechanical action organs from Hill, Norman and Beard; R. H. Walker; J. W. Walker; Mander; and Johnson. Mechanically it was as reliable as the Collins organs which preceded it, but tonally it did not match the work of Collins. Architecturally it was at least a challenge to Collins, and far superior to the very indifferent Rushworth and Dreaper organ for Ealing Abbey. 1975 also saw the production of four further organs by Church, a positive for Matfen Church,[409] one-manual and pedal organs for Breaston[410] and Hartlepool[411] and a two-manual and pedal organ for Marske Parish Church.[412]

The Ealing Abbey organ of 1974 (Appendix A, 83), built under the direction of Alistair Rushworth, was an impoverished instrument which in no way lived up to the hopes raised by Mold. Ralph Downes was initially consultant to the Abbey, and schemes by Walker (for an electro-pneumatic instrument), and Flentrop (for a mechanical-action organ), were under consideration.[413] The Abbey Organist, Colin Atkinson, was impressed by Mold and insisted upon Rushworth's submitting an estimate and proposals, upon which Downes withdrew. The Abbey then called in the Organ Advisory Group and, after discussion, the Chapter agreed to proceed with the Flentrop proposals.[414] Under pressure from Atkinson, this decision was reversed and the Rushworth proposal accepted, whereupon the Organ Advisory Group withdrew. The initial drawings of Rushworth[415] were virtually identical with those for the organ being built by Phelps for Hexham Abbey, and it may well be that Alistair Rushworth had seen the Hexham design whilst training with Phelps. For some reason the advertised (and submitted) design for Ealing was not proceeded with, the Abbey architect blaming Rushworths, and Rushworths blaming the Abbey architect![416] The design as built proved the most undistinguished essay in case design in England in the period under review. As Butterworth wrote: "The front design is not pleasing to my eye."[417] The case, a heavy, lumpy, affair, (Appendix E, 31a, 31b) was largely of blockboard, made up around an arch - hardly a case in a serious sense[418] and the console was surrounded by a "solid and ugly balcony."[419] In addition part of the Pedal Organ employed some electro-pneumatic action, and there was some manual pneumatic assistance.[420] Tonally the organ lacked drive and cutting power in the large Abbey Church, and stood uneasily between the romanticism of earlier Rushworth work and the classicism of Mold. The scales were somewhat wider than at Mold, it being intended that the organ have a more generous warmth (somewhat reminiscent of certain French tones) than the smaller organs of Mold and Belfast.[421] Whilst, as Flentrop's proposals indicated,[422] the position for the Abbey organ was not an easy one, a more ungracious and uninspired solution is hard to imagine. The organ was certainly far from representing "the aural enrichment of a noble and majestic building",[423] as Sayer suggested. It seemed the much publicised training of Alistair Rushworth had come to little. As Butterworth concluded: "It can only be hoped that the demand for classical mechanical organs will be extended and that there will be sufficient opportunity for firms such as Rushworth to climb out of the experimental stage."[424] Sadly, since Ealing the output of mechanical-action organs from Rushworth has consisted of a few unremarkable positives.[425]

Another younger generation builder to return from training abroad in the early 1970's was John Mander: 1974 saw his return from five years with von Beckerath. Initially on his return to his father's firm he worked on the rebuilding of St. Paul's Cathedral organ. His first opportunity to build a mechanical-action organ (other than a small unencased positive), came when the oil-rich Sheik of Oman ordered an organ for his palace, a two-manual organ of twelve stops, completed in 1975.[426]

Of the other firms active in 1974, Grant, Degens and Bradbeer installed a 'standard' organ in Wellingborough School,[427] and Harrisons a twenty-two stop organ for Selwyn College, Cambridge in 1975.[428] The Harrison organ was less than successful, mechanically or tonally of little note; indeed it seems that the Swell windchest had to be returned to the workshop for re-making[429] - an indication of the problems of transition encountered by establishment firms. The only other work in England in 1975, apart from small positives made by Shaftoe, Johnson and Pulham[430] was the completion of the Laycock and Bannister organ for St. Joseph's Roman Catholic Church, Keighley.

The initial proposal for the Keighley organ came from Denis Thurlow, who after leaving J. W. Walkers had first worked freelance, and then took over both Nicholsons of Worcester, and Laycock and Bannister of Keighley, and was also working in conjunction with Kenneth Jones in Ireland. Thurlow's proposal of March 15th, 1973 was for a six-rank extension organ of twenty-eight stops and eighteen pistons.[431] Under the guidance of the writer the proposals were changed to a two-manual mechanical-action organ with a Hauptwerk/Brustwerk layout, and the following specification:

St. Joseph's RC Church, Keighley: Laycock and Bannister, 1974[432]

Great		Positive	
Principal	8	Gedeckt	8
Rohr Flute	8	Koppel Flute	4
Octave	4	Principal	2
Sesquialtera II	2 2/3	Quint	1 1/3
Mixture III-IV	1		

Pedal	
Bourdon	16
Fagott	16

The design and construction of the organ was, as so often in the period under review, a mixed affair. The basic case design and layout, based upon the 1965 van Vulpen organ in Dronten, Holland, was by the writer. The mechanical layout was essentially by Andrew Mayes, an associate of

Table VII/15

St. Joseph RC Keighley	Great	C–c''''	WP 50-55 mm

	C		c		c'		c''		c'''		c''''		
Principal 8' ϕ	152		87		50.8		31.7		19		11.1		90% tin Copper bass octave
Rohr Flute 8' ϕ	127		89		54		34		22		7		30% tin Chimneys from c
Octave 4' ϕ	76		47.5		28		15		11		8		90% tin
Sesquialtera II 2⅔' ϕ	62		38		23		14.5		8		5		30% tin
Sesquialtera II 1⅗' ϕ	51		29		15		9		5				30% tin
Mixture III–IV 1' ϕ	1' 25	2/3' 18	1/2' 13										90% tin
Positive													
Gedeckt 8' ϕ	?c.101	npta											Quebec Pine
Koppel Flute 4' ϕ	23/86		14/57		9/34		5.5/23		5.5/15.5		5.5/10.5		30% tin
Principal 2' ϕ	48		27.5		16		10		7.5		5.2		90% tin
Quint 1⅓' ϕ	30		17.5		12		7.5		5.1		3.9		90% tin

Table VII/15

St. Joseph RC Keighley	Pedal	C-g'	WP 50-55 mm

	C		c		c'		c''		c'''		c''''		
Bourdon 16' ϕ	npta												Pine
Fagott 16' ϕ lower ϕ	120 18												50% tin ½ C French parallel shallots with tinned walls, by Stinkens.
Mixture composition													
Mixture III-IV C A gs	1 1⅓ 2	⅔ 1 1⅓	½ ⅔ 1	 ⅔									
gs' gs''	2⅔ 4	2 2⅔	1⅓ 2	1 1⅓									

Frank Bradbeer who had worked for Grant, Degens and Bradbeer, and the scales (Table VII/15) were by Thurlow and Stinkens.[433] The case chests and wooden pipes were made at Nicholsons, the metal pipes were by Stinkens, and the console chassis was from Pels and van Leeuwen[434] (with whom Jones had been associated). As the drawings (Appendix D, 58, 59), show, the action was straightforward, and employed compensated backfalls, the wind supply was controlled by in-built regulators in Grant, Degens and Bradbeer style.

The voicing was open foot and flue-regulated, the principal mouth widths being 1/4 or 2/9, the flute mouth widths 1/4 and 1/5, and the scales (Table VII/15) commencing near normal. The cut-up was initially set at about 1/5 of the mouth area, and then every pipe was cut up on site by Thurlow.[435] The mixture, breaking irregularly and other than on C, shows clearly the influence of Downes, being similar to the Swell Mixture at the Oratory.

The general construction and finish was good, but deficient in terms of internal design detail, e.g., positioning of winding trunking and controls. That such an organ could have any unity would seem impossible but, aided by an excellent position and rich acoustic, the result was described by Clutton as "one of the best half-dozen small organs I have ever heard...."[436] and, "if anyone doubts that British builders exist who can match the finest work on the continent... Keighley can rival any of them on their own ground."[437] Keighley was however the only new classical organ built by Thurlow and his associated companies, though he did employ mechanical action and a fair amount of new material in his work on the rebuilt organs for St. John the Evangelist, Oxford, and Appleby Parish Church, and in a small three-stop positive organ which was hired out.[438] Without external pressure however, his work reverted to electrical rebuilding, culminating in the post- Ampleforth dinosaur in Warwick Parish Church, 1980 (and the slightly later, and larger, organ for Newcastle Anglican Cathedral).

The trend of importing organs continued: 1974 saw the installation of a second Marcussen in the Nottingham area, - for St. Mary's, Clifton. David Butterworth was the adviser, and the organ appears to have been

St. Mary, Clifton Nottingham	Great	C-g'''	WP 65 mm

	C		c		c'		c''		c'''			
Rørfløjte 8' ϕ mw	115.2 1/4.25		74.5		45.8		28.9		17.4			
Principal 4' ϕ mw	74.5 1/4		43.0		24.8		14.3		9.2			
Mixture III-IV 1 1/3' ϕ mw	28.9 1/4.25		16.1		9.9		6.7		5.3			
			Swell (Brustwerk)									
Gedakt 8' ϕ mw	111.9 1/4		71.8		40.1		24.2		15.9			
Rørfløjte 4' ϕ mw	64.8 1/4		40.1		25.1		17.7		12.9			
Principal 2' ϕ	43.8		24.2		14		8.8		6			
			Pedal				Mixture Composition					
Subbass 16' ϕ mw	210.8 1/4		124.8		75.1		Mixture III-IV C c fs		1 1/3 2 2	1 1 1/3 1 1/3	1/2 1 1 1/3	 2/3 1
Principal 8' ϕ mw	142.6 1/4.25		82.4		49.3		c' c'' fs''		2 2/3 2 2/3 4	2 2 2 2/3	1 1/3 2 2	1 1 1/3 1 1/3
							c'''		4	2 2/3	2	2

Note: It was not possible to obtain any further scaling detail relating to this organ.

Source: Information given by S. Zacharrassen of Marcussen 16.6.83

ordered in conjunction with that for St. Mary's, Nottingham.

St. Mary's Church, Clifton, Nottingham: Marcussen, 1974[439]

Great		Swell (Brustwerk)	
Rørfløte	8	Gedaktfløte	8
Principal	4	Rørfløte	4
Waldfløte	2	Principal	2
Mixture III-IV		Quint	1 1/3
		Regal	16

Pedal	
Subbass	16
Oktav	8

At Clifton the medieval church had been restored and re-ordered by George Pace, who also designed the organ case detail. Andrew Burnham, writing in The Musical Times, considered the integration of the organ with the restored church interior a "feature of the organ's success."[440] Pace's 'architectural', or 'decorative', treatment, however, of the upper part of the case (with its vertical slats, and gaping holes above the pipes), greatly weakens the prospect.[441] Other than the architectural treatment the layout of the organ, shown in the drawings (Appendix D, 60), is typical of many such Marcussen instruments in Danish churches. The scales (Table VII/16), are in no way unusual, the power of the organ being controlled in the small church by the use of slightly small mouth widths, mostly just under 1/4. Overall the organ was a considerable success, described by Rogg as a "superb small recital instrument",[442] and by the organist as a "superb liturgical instrument."[443]

At Hexham, Laurence Phelps completed the largest two-manual classical organ to date. Whereas the Marcussen organs, as also other imported instruments, derived their strength and qualities from the North European organ school, the Hexham organ stoplist suggested another influence, that of the French school.

Hexham Abbey: Phelps, 1974[444]

Great

Bourdon	16	
Principal	8	
Flûte à cheminnée	8	
Octave	4	
Flûte conique	4	
Superoctave	2	
Cornet V	8	from c
Fourniture V	1 1/3	
Trompette	8	
Clairon	4	

Swell

Salicional	8	
Voix celeste	8	from c
Bourdon	8	
Principal	4	
Flûte	4	
Nasard	2 2/3	
Doublette	2	
Flûte à bec	2	
Tierce	1 3/5	
Larigot	1 1/3	
Cymbale IV	2/3	
Basson	16	
Oboe	8	
Cromorne	8	
Tremulant		

Pedal

Principal	16
Soubasse	16
Octave basse	8
Bourdon	8
Octave	4
Fourniture IV	2
Bombarde	16
Basson	16
Trompette	8
Chalmeau	4

The French nature of the organ has been commented upon by Phelps himself,[445] as well as by Wright[446] and Weir.[447] A typescript document issued when the organ was nearing completion (on the occasion of the visit to Hexham of the Incorporated Association of Organists, then in Conference in Newcastle), outlines Phelps' design philosophy. Since there are few such statements on the part of organbuilders, it is quoted at some length:

> "In developing a tonal scheme for the performance of either the German or French Classical literature, the location of the traditional stops within the scheme is of importance equal to the actual choice of stops. In other words the 'where' becomes as important as 'what'. This is especially true for the French compositions.... Therefore, to do justice to this extraordinarily colourful music, I begin with the basic stops of the French tradition all in the

positions this tradition requires. When this has been worked out, it is then necessary simply to add a suitably developed pedal division, select proper compositions for the mixtures, resolve to use classical voicing techniques for all flue and reed stops and to keep the wind pressure as low as possible short of being ineffective. In this way the clarity and transparency of texture which the German polyphonic music requires is also guaranteed.... The organ is colourful in the best sense, without being thick in tone, without being shrill and strident.... This type of tonal design and scaling produces an ensemble that serves most of the major romantic works so well that, when listening to this music played on it, one is likely to forget the essentially classical inspiration of the instrument. This is largely because it creates its "tutti" - the essentially romantic effect - in the same way Cavaillé - Coll first created it (before the symphonic excesses of later work) by ignoring the classical taboo and combining the Grand Jeu and Plein Jeu." 448

Elsewhere Phelps stated:

"The new organ for Hexham Abbey really makes no attempt to imitate from a former period anything except the effectiveness of the old instruments in accomplishing their purpose, any comparison with previous instruments should be based purely on the actual performance of music.... The use of French nomenclature in this instrument will trigger a predictable series of reactions. Careful scrutiny of the Great, Swell and Pedal will reveal that so far as the stop list is concerned, the compromises with French classical practice are largely those of omission. There is no Grand Jeu de Tierce for example and no big Open Flute 8' on the Pedal. On the other hand, the minor compromises with classical practice are additions - chiefly the addition of a pair of string stops and the 16' Basson. Even the presence of the Hautbois 8' has the 1781 Clicquot example in the Récit for St. Sulpice in Paris as a precedent. It is obvious from the stop list that otherwise this division is allotted the tonal function normally provided by the Positive in the French Classical Organ. The 'expressive shutters' with which the Swell is fitted are essentially a romantic feature if they are used for crescendo and diminuendo effects. When they are used either fully opened or fully closed they enable the Swell to serve a dual role, substituting also as a completely enclosed Echo - a cherished French

> Classical feature. Thus, even this feature, normally thought of as a romantic device, serves to broaden also the classical scope of the instrument." 449

Despite this emphasis on the French character of the organ the Werkprinzip layout and actual tonal qualities are, in the opinion of the writer, with the possible exception of the two Cornets, far closer to the reformed north-German school than anything else, a matter which could relate mostly to the final voicing style. In the absence of access to more definitive information on scaling and voicing,[450] it is not possible to comment further than Phelps statement, that the organ has a "bias in the scaling and to some extent the voicing towards the French manner."[451] A reasonably full set of drawings (Appendix D, 61-68), exist, which show both the development of the prospect form, and also the constructional features of the organ.

Whilst the good qualities of the organ are evident - a refined action, well made pipework and casework - the organ perhaps lacks a pronounced individuality, or personality. This could be due to the origins and building of the organ. Initially negotiations between the Abbey and the consultant, Donald Wright, were with Casavant. According to Ronald Lane: "Following a major clash on policy Phelps' employment with Casavant was terminated."[452] The Abbey then debated whether to withdraw, but finally placed the contract with Phelps on his own account.[453] Phelps, having at that time no workshop of his own, considered a working arrangement with Kuhn, but this fell through.[454] The organ was seen under construction at Laukhuffs by William Drake,[455] and the console appears to have been advertised in Laukhuff's own catalogue.[456] It would seem however that Phelps was dissatisfied with the way matters were going[457] and, having acquired workshop premises in Eyrie, had the work shipped to Eyrie for completion and re-shipment to England. Photographs in Donald Wright's possession show the organ under construction at Eyrie.[458] The Hexham pipework would appear to be largely Laukhuff,[459] and the finishing in the building was by Phelps and Clive Webster.[460] Whatever the problems that beset Phelps in the construction of the organ, the scale of building and technical achievements could not be ignored and, as Donald Wright wrote:

> "There cannot be many places in this country where one can find an organ of 34 stops distributed over 2 manuals and pedal which is so versatile to do justice to music of all periods - from de Grigny, Sweelinck and Blow, through Franck, Liszt, Wesley and Stanford to Messiaen, Schoenberg - and Howells, as well as Tippett and Leighton." 461

At the same time it is equally possible that some of the lack of 'personality', alluded to above, is in some way attributable to the 'eclecticism' of the design style - though this is not to deny the presence of an overall consistency attributable to the artistic qualities of Phelps.

The largest organ built in 1974, also imported, was a four-manual instrument by Hradetzky for St. Salvator's Chapel in St. Andrew's University.[462] As at the Royal Northern College, Manchester, Hradetzky used "a basic North German scheme supplemented by other tone colours."[463] Where the Manchester organ was an essay in contemporary asymmetric Werkprinzip the St. Andrew's organ was a more 'classical' solution; the Great and Bombarde in one case, in the main central section; the Pedal in towers on either side; the Rückpositiv (standing on a pedestal), in front of the main case. The Swell was placed below the Great in the base of the main case, behind the base of the Rückpositiv. The console was reversed and forward of the base of the Rückpositiv, with tiered stops after the style of Cavaillé-Coll.[464] The tonal quality is somewhat 'hard', due to the rather dry and unfavourable acoustic.[465] In relation to Phelps' description of his design philosophy for Hexham, in which a 'universal' approach is derived from a French classical basis, at St. Andrew's the 'opposing' line was adopted of providing a "basic north German scheme supplemented by other tone colours from other schools,"[466] the result of which was, in Kitchin's opinion, "a marvellously, flexible and versatile 20th-century instrument."[467] By contrast with the large St. Andrew's organ was a small positive, noteworthy for its use of all wooden pipes, which was imported from Sandtner in Southern Europe.[468]

Downes' predilection for Flentrop was again shown in 1975, when he advised over a new small organ for the Little Oratory Chapel, Brompton Oratory,[469] where Downes was still organist. Downes required the organ to be fitted within and encased behind, an existing Italian style facade[470] (not a new facade, as Peter Williams implied),[471] with a new Principal 8', from G, placed in the facade. This requirement determined the choice of builder: "Of the three firms consulted - two of them British - only the Dutch firm of Flentrop was ready to provide this sensible solution without alterations in the facade or other forms of spatial extravagance."[472] Curiously the new Principal 8', in prospect, contained a number of embossed pipes the embossing being in a Northern, 'Dutch', style rather than in an early Italian style, such as in the prospect of the di Prato organs in Bologna. Equally curious was the fact that the organ was Werkprinzip in layout rather than Italian, with a central Hoofdwerk, Pedal at the sides and a tiny Bovenwerk (with swell shutters), centrally over the Hoofdwerk. Despite the presence of Downes the regulations of the principals and reeds was poorer than might have been expected,though the flutes and Sesquialtera were more satisfying,[473] making it all the more sad, in view of Downes' personal friendship with Dirk Flentrop, that Downes and Flentrop had not had the opportunity to work together on a larger organ in more favourable circumstances.

Walkers were now under the management of Robert Pennells and, based in Pennells and Sharpe's workshop at Brandon, moved back into the classical field with the building of a small positive.[474] Grant, Degens and Bradbeer merely produced one six-stop practice organ,[475] while Johnson continued building small scale box positives.[476] Another small builder Martin Renshaw, who had been a student at Christ Church, Oxford, at the time of the installation of The Queen's College organ, entered the classical field with a number of box organs,[477] a house organ[478] and a two-manual instrument of twelve stops at Upper Hadres,[479] the Werkprinzip concept of which (similar in principle to the c1632 organ in the Franziskaner Kirche, Vienna),[480] was perhaps its most important attribute. Alongside native building the presence of imported organs, in 1976 from Frobenius and Metzler, provided a goal and a spur.

At this stage Collins dominated the English scene, closely followed by Church, Collins' production in 1976 being eight organs (81 stops) and Church six organs (50 stops). Collins continued his production of box and practice organs,[481] the most significant of these being the practice organ ordered by Lionel Dakers for the Royal School of Church Music:[482] for the ultra-conservative Royal School of Church Music this organ was indeed revolutionary, and its influence should not be underrated. It was also the first organ in which Collins abandoned aluminium 'T' section pallets, and began to use wooden pallets. Collins' development also continued on a larger scale, and 1976 saw the completion of two substantial instruments, Sacred Heart Roman Catholic Church, Henley, and Dorchester Baptist Church.

At Henley, Collins was fortunate in having an adequate budget from the outset for the organ. The initial estimate, of 1973, for eleven stops was £7,640, the final cost was estimated by Collins as £12,570 but because of the form of payment involving a 50% first payment and partly fixed price the final cost, (for fifteen stops) to the church was £9,642.[483] The writer was adviser, and both Collins and the writer had the full support of the organist, Frederick Rogers.

Rogers chose Collins on the basis of seeing the Brasenose organ under construction, when he was impressed by what he saw as a dedicated team of craftsmen (then eight in number, excluding Janet Collins who acted as the firm's secretary), at work. Henley proved a more secure organ in every way than Brasenose.

The existence of a west gallery led quickly to the decision to build an organ with Great and Pedal in the main case, and Rückpositiv on the gallery rail.

Henley-on-Thames, Sacred Heart Roman Catholic Church: Collins, 1976[484]

Great		Rückpositiv	
Principal	8	Gedact	8
Rohr Flute	8	Principal	4
Octave	4	Rohr Flute	4
Quint	2 2/3	Principal	2
Gemshorn	2	Quinte	1 1/3
Tierce	1 3/5	Dulcian	8
Mixture II-IV	1 1/3		

Pedal	
Bourdon	16
Principal	8 (Gt)
Fagot	16

Though the acoustic was not especially helpful the organ proved very satisfactory tonally. The voicing, basically open-foot (with a little nicking), was warm and full, and less sharp than Collins' previous work. The scales (Table VII/17), derived from the pattern set at Cranford and tend to narrowness. The Great Principal was, however, overloud, due to both mouth-width and cut-up being too large (the lowest notes of the Principal 8' had to be returned to the workshop for remaking because the mouth had been cut up too far). The two reeds were bought in from Giesecke. The difficulty of final finishing and tuning remained, as is shown in a memorandum to the Parish Priest (from an organ-enthusiast parishioner), in which it was commented that "the tuning has been beset with problems" and is still "not very stable."[485] In the years since, however, the organ has proved very stable in its functioning.

Overall the finish of the organ was superior to Collins' earlier organs, and the case, in American red oak, was well made. Its design followed Dutch/North German models by builders such as van Vulpen, Leeflang, and Ahrend and Brunzema, and had a logical prospect (Appendix D, 69) containing all the pipes of the Principal 8' - plus one dummy. The prospect was much enhanced by pipe shades, designed by John Brennan and carved by Collins.

The action was straightforward, the keys were centre-pivoted, the Great

Henley RC	Great	C–g'''	WP 60 mm

	C		c		c'		c''		c'''	g'''		
Principal 8' ϕ	135		75		45		26		16	11		All in prospect plus one sham g♯''' 90% tin Languid 70°
mw	113		60		36.5		21.5		12.5	9.5		
Rohr Flute 8' ϕ	105		65		43		28		18.5	14.5		20% tin Languid 50°
mw	87		52		34		22		15	12		
Chimney ϕ				f♯ 10	10		7.5		5.5	4.5		
L				80	67		50		37	30		
Octave 4' ϕ	72		43		25		16		10	8		1-30 20% tin 31-56 70% tin Ears 1-37 Languid 70°
mw	57		34		19.5		13		8.5	7		
Quint 2⅔' ϕ	66		39		24		16.5		11	9		1-36 20% tin 37-56 60% tin Ears 1-24 Languid 60° As Lancaster
mw	40		26		16		11.5		7.5	6		
Gemshorn 2' ϕ	20/60		15.5/40		12/26		9/16.5		7/11	6/8.5		1-30 20% tin 31-56 95% tin Ears 1-20 Languid 60°
mw	35		25		17		10		8.5	6.5		
Tierce 1⅗' ϕ	48.5		29		17		11		7.5	6		1-30 20% tin 31-56 60% tin Ears 1-18 Languid 60° As Lancaster
mw	30		18.5		12		9		6.5	5.5		
Mixture 1⅓' ϕ	29		18		11		7		5	4		70% tin Languid 70°
mw	33		14		8.5		5.5		4.25	3.25		
1' ϕ	24		15		9		6		4	7		70% tin Languid 70°
mw	19		12		7		5		3.5	6.25		
2' ϕ			24		15		9		6	4.75		70% tin Languid 70°
mw			19		12		7		5	4		
2⅔ ϕ					18		11		7	5.75		70% tin Languid 70°
mw					14		8.5		5.5	5		

Henley RC	Rückpositiv	C–g'''	WP c.50 mm

	C		c		c'		c''		c'''		g'''		
Wood Gedact 8' ϕ	95x75		60x47		42x31		30x22		20x16.5		17x14		Oak and Sycamore. As RSCM
Principal 4' ϕ	70		41.5		24		14		8.5		6.5		95% tin Ears 1-35 Languid 70°
MW	55		32.5		19		11.5		7		5.5		
Rohr Flute 4' ϕ	60		40		26		16		5/16		5/10		20% tin Ears 1-44 Languid 60°
MW	47.5		31.5		20.5		13.5		12.5		9		
Chimney ϕ	10		8.5		7		6						
L	120		85		43.5		22						
Octave 2' ϕ	41.5		24		14		9		6		5		60% tin Ears 1-24 Languid 70°
MW	31.5		19		11		7.5		5		4.25		
Spitz Quint 1 1/3' ϕ	15/46		11/30		8.5/18.5		6.5/12		5/7.5		4/6		Languid 60° 1-24 20% tin 25-56 60% tin Ears 1-18
MW	25		17		12		8		5.5		4.5		
Dulcian 8' ϕ	26x26		22x22		20x20		18x20		18x20		18x20		Mahogany Giesecke
			Pedal						Mixture Composition				
Subbass 16' ϕ	200x200		120x120		79x82	f' 66x71	Mixture II-IV	C	1 1/3	1			oak
								c	2	1 1/3	1		
								c'	2 2/3	2	1 1/3	1	
Fagot 16' ϕ	116		88		66			cs''	2 2/3	2	2	1 1/3	20% tin
Resonator L	2450		1300		720								
Shallot L	102		58										
Slot width	4.5/5.5		4/5										
Shallot tip ϕ	13		10										
Shallot head ϕ	16		12.5										

Source: P.D. Collins scale sheets

and Pedal actions having a vertical tracker from the key to a Grant, Degens and Bradbeer style, hydraulically damped, floating backfall beam; then a second vertical tracker to the rollerboard; and a third tracker to the windchest. The Rückpositiv action had a vertical tracker from the key to a square, then a horizontal tracker to the rollerboard and a third tracker to the windchest in which are vertical pallets. The coupler action used free 'floating' backfalls (Appendix E, 32) and was the first of a type Collins continued to use into the 1980's. As in the Royal School of Church Music organ, wooden pallets were used. Whilst these helped to give a better touch, the touch remained somewhat spongy and heavy (see Chapter VIII), due to inadequate tensioning, with too much reliance on the pallet spring, and too much friction due to the many points of movement in the action (Appendix E, 33). The result was an action with no clear point at which the opening or closing of the pallet could be felt, and the coupled touch was too heavy for other than limited use. If the action was not especially subtle, it did prove consistent and reliable, and as such was an advance. The console was typical of the style developed by Collins (Appendix E, 34, 35).

The specification perhaps attempted too much, the Great Nazard and Tierce would perhaps have been better in the Rückpositiv (as a Sesquialtera of narrower scale), and the Gemshorn a Fifteenth. Had this been so, the II-IV rank Mixture, regularly used by Collins, would perhaps not have 'stood away' quite so much from the 8' and 4' principals. There was also an over-emphasis on the treble, and lack of richness on the bass, brought about by the composition of the Mixture, it having only two ranks in the bass and relatively few breaks. The pipework was made in part in Collins' shop, in part by Rogers (in particular the prospect), and the reeds were by Giesecke.

Possibly the most significant features of the organ were the improvement in security of finish and action, and the movement away from a sharp, thin sound to a softer tonal concept (involving the use of some nicking and foot regulation), especially in the Rückpositiv.

The organ for Dorchester Baptist Church[486] was on a larger scale, planned as a three-manual of thirty stops with Hauptwerk, Oberwerk and Brustwerk, though initially only the Hauptwerk, Oberwerk and Pedal Organ were built. Voicing, action and style were very much in the Henley manner. The wide flat prospect was a development of that at Worksop. The organ suffered however from initial problems of action, windchest and wind supply; the latter was Collins' first use of a single-rise wedge bellows.

In the north, Nigel Church, almost unnoticed, continued to make steady progress. 1976 saw the completion of organs in Scarborough,[487] Hucknall,[488] Trent College,[489] and Newcastle Lutheran Church.[490] With these organs a 'builder style' was beginning to emerge, if a little tentatively. Tonally the organs remained somewhat hard and sharp, and architecturally the angular asymmetric cases at Scarborough, Trent College and Newcastle, whilst derivative of Scandinavian models, were lacking in the distinction of, for example, the Frobenius organ in the Danish Seamen's Chapel, or even the Bradbeer case at St. Martin's, Hull. At Hucknall, the largest organ then built by Church, the layout was a vertical one, an 8' Great, over a 4' Swell, with the Pedal in the rear of the case. The prospect was noteworthy for the use of inverted principals in the upper and lower centre flats. Whilst the three-tower, 'squarish', prospect was logical, the total architectural effect was heavy and lacking in grace. This was caused largely by the use of pipes with too short feet in the towers, rather hard pipe-top and -mouth lines in the flats, over-emphasis on the large 'Brust-swell', flat panelling with little relief, and tower cappings of insufficient strength. Overall the finish and mechanism was reliable, though the Swell door mechanism was clumsy. Tonally the flute stops were warm and mellow, but the principals sharp and aggressive. The Pedal organ had considerable 'muscle' and independence, and the whole organ was given much character by this division. The influence on the voicing of the trade pipe suppliers, Rogers, was evident. Stephen Buckle of Rogers voiced some of the organ in the church, and Church himself seems to have been influenced by Norman Fitton, an elderly voicer retired from Binns, Fitton and Haley of Leeds, to whom many trade organ builders went for advice on scaling and voicing.[491]

In 1976 ten Bruggencate completed the organ for Northampton Roman Catholic Cathedral.[492] Here the initial budget of a mere £8,500 allowed only for some nine or ten stops, yet an organ had to be provided to lead a full congregation and accompany the choir. It was possible to place the organ in an excellent position in the north transept gallery. In order to project the organ sound into the body of the Cathedral the two manual divisions were placed on a divided chest on the gallery rail in Rückpositiv fashion (the first such two-manual organ in England), the Pedal Subbass 16' being placed at the rear of the gallery (Appendix D, 70). The console was detached and raised behind the main case. The specification provided a Blockwerk principal chorus 8', 4', IV, topped with a Trumpet 8', on Manual I; and a flute chorus, 8', 4', 2', 1 1/3', together with a Sesquialtera II, on Manual II. The case design was derived from Metzler's practice, as can be seen by comparing the Northampton case and shades with the Metzler cases at St. Alban, Basel (1965), Rothenfluh (1967), and especially the Martinskirche, Zurich (1972)(Appendix E, 36-38). The metal pipes were made by Klein (of Göttingen), the wooden ones by ten Bruggencate, the scales are given in Table VII/18. Tonally the organ had fresh clean principals, on the narrow side and with no stridency - if somewhat irregular - warm flutes with good blend, the second manual giving a rich strong Cornet. All in all very much a Metzler sound, tempered with some Dutch mildness. The general lack of finish of action and voicing was commented upon by David Butterworth: "the organ will be a great success. All the fundamentals - the concept, the casework, the scaling - are right. It only remains for Mr. ten Bruggencate to roll up his sleeves and finish off the job properly."[493]

This lack of 'finish' was perhaps due in part to the organ having to be encased in polythene, just prior to completion (due to the Cathedral roof requiring major repairs), but also to the apparent inability of ten Bruggencate to give his organs the tonal, mechanical and woodwork finish their concept deserved. Another reason for this lack of finish was the need (financially), to get on to the next organ, a problem ten Bruggencate shared with Collins. Also Bruggencate persistently worked with budgets which were too small in relation to the work being undertaken.

Northampton RC Cathedral	Manual I	C–g'''	WP c.65mm

	C		c		c'		c''		c'''		g'''		
Prestant 8' ϕ	(135)	F 119	88		52.5		31		18.2				From F open in prospect. C–E std. Klein
Octaaf 4' ϕ	79		46.5		26		15.4		9.2				Klein
Mixtur IV 1⅓' ϕ	29		17.1		10.2		6.3		3.9				Klein
1⅓' ϕ	25		15		9.1		5.5		3.3				
Trompet ϕ	npta												Klein

Mixture composition

Mixture IV	C	1⅓	1	⅔	½
	c	2	1⅓	1	⅔
	c'	2⅔	2	1⅓	1
	c''	4	2⅔	2	1⅓

Table VII/18

Northampton RC Cathedral	Manual II	C–g'''	WP 65mm

	C		c		c'		c''		c'''		g'''	
Gedeckt 8' ϕ	90x 61		64x 39		42x 23		28x 16		19x 7.5			
cu	29		19		11		7		4			
Roerfluit 4' ϕ	85		52.5		32.5		19	9''/14.8 95''/15.4				
Gemshorn 2' ϕ	55		33.9		20.6		12.6		7.8			
Quint 1⅓' ϕ	35		20.6		12.4		7.3		4.4			
Sesquialtera II 2⅔' ϕ	70		43		26.5		16.1		10			
Sesquialtera II 1⅗' ϕ	45		27.7		17		10.4		6.4			
			Pedal									
Subbass 16' ϕ	npta											

Source: MS notes in the posession of Dominic Gwynn, Northampton.

Other than Collins, Church, and ten Bruggencate, only Hill, Norman and Beard produced work of any size. Two organs, one for St. Mark's Comprehensive School, Hornsey,[494] the other for Shorncliffe Garrison Church,[495] were built by them in 1976. Though the firm was now managed by Frank Fowler, some influence of Herbert Norman remained, the case designs for both Hornsey and Shorncliffe being by him. Neither organ however betrayed any particular character in musical, mechanical or visual terms. The Shorncliffe organ, characterised by its zinc prospect, was especially undistinguished.

These organs demonstrated the problems of older firms when attempting to build classical organs. Without a person committed to the building of an organ as artistic entity, and in charge of design, construction and finishing, the result was inevitably less than totally convincing. Whatever the shortcoming of builders such as Collins, ten Bruggencate and Church, the organs built by them all showed some continuing development of character.

Though there were but two organs from overseas builders in 1976, both were important. In the historic church at Stoke d'Abernon, Frobenius built a two-manual organ of sixteen stops.[496] The initial case design was based on the 'swallows nest' organ, from the seventeenth century, in Freiburg Cathedral,[497] but this design was later abandoned in favour of the design as built. The layout and specification were both simple, Hovedvaerk and Pedal in the main upper case, Brystvaerk and console in the lower case. The sound was clear and refined, though overall too loud for the small church. Despite this, in its craftmanship and voicing, the organ stood head and shoulders above comparable English work.

The second organ, for Trinity College, Cambridge was by Metzler. Although based on the remaining Smith case and some pipework of 1708, it was to all intents and purposes a new organ. Smith's organ had had twenty-two stops and three manuals, Great, Chaire and Echo, with GG (long) compass.[498] Expansion over the years had left the Smith work submerged under a mass of subsequent material.[499] An initial report regarding the organ was made to the College by Richard Marlow, the Organist, followed by a second report by Peter le Huray (as Diocesan Organ Adviser) and Cecil Clutton, representing the Organs Advisory Committee.[500] Estimates were sought from Harrison, Mander, Ahrend and Brunzema, von Beckerath, Metzler, Frobenius, and Schuke (of Potsdam), a list which, with the exception of Schuke, had become almost standard by the early 1970's.

The comparative schedule arising from the estimates (Appendix F, 19), detailed by Marlow, is a remarkable document which indicates the care with which he, in discussion with le Huray, approached the matter. Leaving aside questions of artistry, the cost differentials, for a three-manual organ of around forty stops, were considerable, ranging from Metzler and Marcussen at £666 and £722 respectively per stop, to Harrison, Frobenius and Mander at around £940, £1,000 and £1,037 respectively per stop. For Mander, with limited experience in building mechanical-action organs on any scale, and Harrison with hardly any such organs to their credit, their costings must surely have been reflective of prestige pricing or fear of unknown problems.

An interesting sidelight, shown in correspondence over the organ, was the insensitivity towards the old material exhibited by Noel Mander, who not only proposed that the money spent on restoration of the case "would be better spent in providing an adequate instrument suitably arranged within the case,"[501] but went on to suggest "that the entire pipe front be replaced by a completely new set of pipes... of 95% tin"[502] and that "if the old pipes are retained we would insist that they become merely a dummy facade, duplicated by more substantial pipes within the organ."[503] For a builder with avowed antiquarian interests, the statements are remarkable.

Marlow visited organs by all the builders being considered. Of these the work of Ahrend and Brunzema, and Metzler stood out, but Ahrend and Brunzema were in the process of splitting up. So it was the artistry of organs by Metzler (such as Baden and Frauenfeld), which Marlow found totally convincing musically, coupled with workmanship where care and quality were self-evident, and their knowledgeable and sympathetic approach to the Smith case and pipes, which were the deciding factors in the contract going to that firm.[504]

Under the direction of Bernard Edskes, of Metzler, a forty-two stop organ was built utilising the Great and Chair cases and some nine ranks of Smith pipework.[505] The ensuing disposition was: 16' Hauptwerk, 8' Rückpositiv, 4' Schwellwerk, and 16' Pedal; the Pedal being placed in the main case on the same level as the Hauptwerk, the Schwellwerk being in the rear of the case foot. The Schwellwerk was considered as an 'extension', in principle, of Smith's Echo organ. Smith's case, on the screen, with east and west prospects had two 8' Diapasons, one in each prospect, of long GG compass.[506] The existence of the two Open Diapasons enabled Metzler to build an organ with a Hauptwerk 16' and Chair 8' relationship, the west Open Diapason being employed at 16' pitch on Great and Pedal, the east Open Diapason becoming the Great Octave 8'. The Smith GG compass Principal 4' on the Chaire became an Open Diapason 8'. Whilst the justification for treating an essentially seventeenth-century, long-compass 8' organ with two prospects in this manner remains a matter for debate, especially the use of the Chair Principal 4' as an 8' Open Diapason, there is no denying the beauty of the organ. As le Huray has remarked: "it is beautifully fitted to the building - both tonally and visually"[507] and "the sounds it produces are gorgeous."[508] Le Huray also noted (in 1980), that: "Mr. Edskes has yet to publish details of the Smith pipework;"[509] since then however, Metzler have made available some details of scales[510] (Appendix B, 7). These show that the treatment of the Great diapasons 8', 4', 2', as re-employed by Metzler was consistent with Smith's practice, as shown in the nearby University Church,[511] in the Talbot MS,[512] and at Pembroke College, Cambridge,[513] and these three stops arguably give the most convincing representation of Smith's sound currently available in England.

Another curious aspect of the organ is its wind supply. This is of large 'pan' or Schwimmer type, placed in the screen reservoir, and from which long fairly narrow trunks (with concussion bellows) are led to the various divisions. The resulting wind supply certainly 'breathes', some would say that it is downright unsteady.[514] Without doubt some players are capable of utilising this facet of the organ expressively[515] (e.g., Rogg), but others find it disconcerting.[516] Whilst the organ is, as le Huray wrote, "no historical reconstruction,"[517] the use of a 'pan', or Schwimmer, reservoir rather than the older style wedge bellows is strange, especially when the organ has its roots so firmly in the past.

The most significant development in the following year, 1977, was the building of the three-manual organ for the Turner Sims Concert Hall of Southampton University, by Collins. From the beginning of discussions between the Professor of Music, Peter Evans, and Collins, in 1975, the organ was conceived as a straightforward North German style organ with Hauptwerk, Oberwerk and Brustwerk.[518] The pipework of Collins' 1969 continuo organ,[519] owned by the University Music Department, was utilised as the basis of the Brustwerk. The rectangular prospect and very shallow case depth resulted from the need to keep the floor space occupied by the organ to a minimum. The final pipe prospect and case detail resulted from discussion between Collins and the University architect. Tonally the organ followed the style of the Henley and Royal School of Church Music instruments (the scales are given in Appendix B, 8). It was however somewhat milder, due in part to its position (on the floor, or 'pit' of a relatively small concert hall), with the audience in tiered seating opposite the organ, and rising for the full height of the organ, and in part to a seeming further reaction on the part of Collins against open-foot, nick-free voicing. The touch was an improvement on Henley, crisper, and more acceptable when coupled. The coupler mechanism, similar to Henley, was less than satisfactory at first. The mechanical problems of Collins were still present, as they were at Dorchester Baptist Church,[520] an organ built just prior to the Southampton instrument. The principal significance of the Southampton organ was, as Peter Williams wrote, in its being "a creditable North German instrument with fewer eclectic elements by a British builder."[521]

In the Nottingham area the influence of David Butterworth continued to have effect; 1977 saw the building by Church, with Butterworth as consultant, of a ten-stop, two-manual organ for Sandiacre Parish Church.[522] This had an unusual disposition in that, although it was placed in the west gallery in the traditional Hauptwerk and Rückpositiv manner, the Great (HW) was enclosed as a Swell (an idea similar to the 19th century enclosed Great organs of Hill and Bishop, as also that of the 1941/59 Frobenius organ in Virum[523]) and placed behind part of the Pedal Principal

8', which was in prospect,[524] the remainder of the Pedal Principal being placed in the side towers. The architectural design was by the architect/organ builder, Roger Pulham, who had established a working relationship with Church. The tonal design, scales and disposition seem to have been heavily influenced by Butterworth, and demonstrate the Anglican desire to have the best of all worlds, even within ten stops - the 'ecclesiastical' desire for a 'full swell' was clearly dominant. Tonally the organ was more assured and cohesive than Church's earlier work, and the construction of the organ showed a marked improvement, both mechanically and structurally. The casework, of Lebanon cedar, was particularly well finished. This improvement in the handling of materials was largely the result of Church obtaining good quality craftsmen, made redundant in the declining shipyards of the North-east, and re-training them to build organs - a similar circumstance to that of Holtkamp in his early days.[525] Church's development was also assisted by the building of a number of small positives during 1977.[526]

Another unusually disposed organ, one stop smaller than Sandiacre, was that built by John Mander for the Roman Catholic Church in Sydenham.[527] Here the recessive nature of the transept gallery, coupled with limited height, led to a Hauptwerk/Brustwerk disposition being adopted, but with the Hauptwerk being placed in Rückpositiv position on the gallery rail, and the Brustwerk being placed above the keyboards, flanked by pedal towers - a solution often adopted by Danish builders such as Marcussen and Bruhns. The organ had a crisp, clean action, largely composed of standard trade parts by Laukhuff. The sound was rich and clear and showed considerable security of voicing. It was enhanced by the use of a 'circular' temperament by van Biezen.[528] The organ was also important in that it marked the effective re-entry of John Mander into classical organ building in England, and the beginning of further revitalisation of the Mander firm after the sapping experiences of St. Paul's Cathedral. The Sydenham organ showed John Mander capable of producing an organ with a clearly defined character, strongly influenced by his training with von Beckerath. Though Sydenham was a more restful organ than the von Beckerath instrument in Clare College the tonal relationship is very evident, one of fullness, richness, clarity and a tendency towards loudness.

Following the Sydenham organ Mander built an eleven-stop organ for Mellor Parish Church,[529] this time with a normal Hauptwerk/Brustwerk layout, the Brustwerk having swell shutters. Architecturally the organ displayed considerable insensitivity towards the interior of this small medieval church, its raw boxes and wooden Subbass 16' in prospect lacking any grace or harmony. How Clutton could refer to it as "elegant and dignified",[530] and "notably subtle",[531] is beyond comprehension. Clutton's comment, in the same review, that the organ "is not at all a German one; it is very much a John Mander concept"[532] is no less difficult to understand: the organ is a very plain 'reformed' instrument, stemming from the Chororgel of the Petrikirche, Hamburg, on which John Mander worked while with von Beckerath. The German nomenclature of the stop list merely confirms the heard sound, which is full and aggressive, and unfortunately lacking in the subtlety ascribed to it by Clutton.

Of the remaining work completed in 1977, five organs are perhaps worth mention. In Cranleigh School Grant, Degens and Bradbeer built their last instrument of any serious pretension - an eighteen-stop, Hauptwerk/Brustwerk instrument.[533] The case, reminiscent of the Nottingham (Clifton) Marcussen organ, was designed by an architect, and organ enthusiast, John Finlayson. The general impoverishment of the organ is typified in the use of a zinc prospect. Prospect apart the organ was very much an extension of the Dunchurch 'standard' organ. Its building and voicing were largely the responsibility of John Bailey who, by 1977, was the mainstay of what remained of Grant, Degens and Bradbeer. In the Royal Academy of Music, Walkers built a two-manual practice organ[534] of no significance except that it was the only mechanical-action organ in the Academy until 1983. In the Church of the Ascension, Blackheath, Matthew Copley, an ex-employee of Grant, Degens and Bradbeer, built a two-manual-and-pedal organ of fifteen stops.[535] Tonally and mechanically it was unremarkable, other than in its employment of a Rückpositiv. In Burgess Hill, Roger Pulham built a one-manual and pedal organ of seven stops;[536] this had an attractive prospect and was unusual in its use of scales from Bédos.

It is hard to imagine a greater contrast between the one-manual, seven-stop Burgess Hill organ, built solely by an individual, and the fifth organ of 1977, a forty-stop, three-manual instrument, costing around £74,000, for Huddersfield Polytechnic.[537] The builder of this, then the largest mechanical-action organ by a native firm, was Philip Wood, a local organ builder. In fact the organ was produced by a consortium.[538] The tonal design was by Keith Jarvis of the Polytechnic Music Department and Philip Wood; the scales were by Norman Fitton, Philip Wood and Keith Jarvis; the flue voicing by Norman Fitton; and the reeds by Stephen Buckle of Rogers; the on-site completion was overseen by Philip Wood. The constructional materials were bought in, the case and soundboards from P & S Organ Supply Co.; the piston action from Solid State Logic, both firms run by Pennells, who was then in the process of taking over Walkers. The pipes were from Rogers; the console chassis from Heuss; and action parts from Laukhuff. The case design was by David Graebe, an architect associated with Pennells and Walkers[539] and the drawing in the brochure issued by the Polytechnic is clearly a Walker shop drawing (Appendix D, 70a). The complexity, and extent, of the inter-relationships is also shown by the fact that J. W. Walker themselves advertised the organ implicitly as built by them, describing it as a three-manual, sixty-rank organ built for a "Trade customer, England."[540] Also, in a leaflet entitled <u>J. W. Walker.... 400 years on....</u>,[541] there is shown an untitled prospect, clearly related to the Huddersfield prospect, which appears to have been one of the possible designs considered by the Polytechnic.

According to Philip Wood the scales and stoplist were arrived at from a study of the early issues of <u>ISO - Information</u>.[542] Particularly influential was the September 1972 issue, which included drawings and scales of two Swiss organs built in 1970, that in the reformed church in Hausen am Albis, by Ziegler,[543] and the forty-seven-stop organ by Kuhn in the Prediger-Kirche, Zürich.[544] The Huddersfield stoplist has many points of similarity with the Kuhn organ, the Swell and Pedal organs being almost identical, the Huddersfield <u>Oberwerk</u> paralleling the Zürich <u>Rückpositiv</u> - even to the point of containing a wide-scale Sesquialtera, unusual in a basically narrow division. A notable point of difference is in respect of the <u>Hauptwerk</u>: at Huddersfield this lacks principals at 2 2/3' and 2' pitches, though its first Mixture is pitched at 2'. The scales of the organ (Appendix B, 9), are much smaller than those of the Kuhn organ and appear similar to those of the Ziegler organ. Another Swiss influence may be detected in the case design, which may be regarded as a 'watered-down' Grossmünster prospect.

Jarvis specified that "the organ should be scaled and voiced in a singing style,"[545] an aim which was to some extent realised, though the overall tonal style lacked any clear relationship to any specific style, inevitable in a consortium organ which aimed to be "a general purpose instrument",[546] "an organ of the 20th Century, rather than one falling into a Classical or Romantic idiom."[547] The element of compromise implicit in an organ designed to provide "an adequate interpretation of nearly all compositional styles of Organ Music"[548] is seen clearly in the Swell Organ (with its 16' Basson and 8' 'French' Trompette), a division in which "the Principal Chorus is based upon a 4' pitch level thus providing a compromise between the typical English Swell and the requirements of a German Rückpositiv."[549] The diverse requirements of the French, German and English repertoires are not satisfied by the provision of a large Brustwerk with Swell shutters, even with the presence of a "divided Cornet."[550] The problems of producing a light and responsive action on such a large organ, with its deep windchests, were not entirely solved; pneumatic assistance was initially applied to pallets in the lower part of the compass to lighten the touch, and later to the whole compass.[551] The position of the organ, on the main axis at the eastern end of St. Paul's, a redundant Georgian church with favourable acoustics, converted into a concert hall by the Polytechnic, was very satisfactory. The output of the organ was well matched to the building, rather better matched than the case which, whilst dramatic, is intrusive rather than complementary. Overall the contrast between the production of the Huddersfield organ, and the work of the small craft shops of Collins and Church was marked, and it is not surprising that the result was a 'reformed' organ of fair size, but little character.

The importation of organs continued, four small workmanlike organs being built for Roman Catholic Churches in Woolhampton,[552] Marlow,[553] Morden[554] and Roehampton[555] by the Freiburger Orgelbau, who also built a small house organ for Christopher Pearson in Wheatley.[556] Of the

Table VII/19

Douai Abbey St. Mary's Church	Manual	C–g'''	WP 65mm

	C		c		c'		c''		c'''		g'''		
Holzgedeckt 8' ϕ	102 x 83		62 x 49		38 x 30		24 x 19		15.2 x 12		11.5 x 9		1–12 Oak 12–56 Maple
Prinzipal 4' ϕ mw	78 58.3		45.5 35.7		27.5 21		15.7 12.3		9.7 7.6		7.3 5.7		75% tin prospect 70% internal Languid 60°
Rohrflöte 4' ϕ mw	62.6 1/4		37.2 1/4		24.1 1/4		18.7 1/4	g'' 12.8 gs'' 3.7/14.7 1/4.5	3.1/12.5 1/4.5		2.2/8.9 1/4.5		40% tin
Chimney ϕ L	9 108		7.4 67		6 44		4.5 33.2	g'' 3.2 24					
Octavin 2' ϕ mw	48.2 29.1		30 17.7	f 27 fs 31.3 f 16 fs 18.9	24.5 14.2		15.3 9		9 6.2		6 4.3		1–12 50% tin 13–56 70% tin overblowing from fs. Languid 60°
Quinte 1⅓' ϕ mw	35.6 22.5		23.1 15		15.3 10.7		19.1 7.1		6.5 4.7		4.5 3.2		70% tin Languid 65°
Superoctave 1' ϕ mw	23.5 1/4		14.6		8.8		5.7		3.8		3.0		70% tin Languid 65°
Sesquialter 2⅔' ϕ					14.2 1/5		8.7		5.5		3.9		70% tin Languid 70°
Sesquialter 1⅗' ϕ					10.1 1/5		6.5		4.2		3.6		70% tin Languid 70°
			Pedal										
Subbass 16' ϕ	192 x 152		116 x 92		73 x 58	f' 60.5 x 48							Mahogany

Source: MS scale sheets by H. Späth of Freiburger Orgelbau four church organs the one for Douai Abbey Old Church was the most satisfying in that it contained fewest compromises. It had a straightforward prospect in the style of the c1450 organ at Kiedrich, with a three-tower case in oak, a 4' prospect with horizontal mouth line, and the Subbass 16' placed behind the case. The action was centre-pivoted with a floating backfall, the tension maintained by a pneumatic motor. Unusual was the use of an overblowing Octavin 2', the pipes of which from E-f were placed in the two flats in the prospect (Appendix D, 71). It would appear to be the first overblowing register in a classical instrument in England. The voicing was secure, with some over emphasis on initial transients, and a shade too loud. The scales are given in Table VII/19. The organs for Marlow, Roehampton and Morden each had elements of compromise in the prospect in order to achieve a good scale of relationship with the buildings. At Morden and Roehampton part of the 16' Subbass was placed, in tin, in the towers with some over-length to give the impression of an 8' prospect; at Marlow the 4' Rohrflöte was placed in prospect, the canisters inverted and well down in the pipe (Appendix D, 72). All the organs built by the Freiberger Orgelbau were tuned in Kirnberger III.[557] These unpretentious, but well constructed organs from a small German firm, provided a yardstick against which builders such as Collins and Church could assess their development. Such self-assessment was perhaps a rather more realistic a measure of progress, in English organ building, than the persistent, and unrealised, attempt to equal the distinction of Frobenius at Queen's College.

Until 1977 the 'classical organ' in Britain had been seen largely in terms of the German (and mostly north German), organ, and its recent descendants. The installation of two organs from Italy by Tamburini in the Roman Catholic Churches of St. James', Reading,[558] and St. George, Dorridge,[559] were reminders that there existed classical traditions other than the north German. Though the two organs were in no sense strict copies of old Italian organs, certain of their features were clearly derived from the old Italian practices of di Prato and Antegnati. The scales of both organs were based on those of the 1536 Antegnati organ in Brescia old Cathedral, and the suspended actions (Appendix D, 72) employing thin iron rollers, were similar to those of the di Prato organ of Bologna Cathedral, which was under restoration in the mid-1970's in the Tamburini workshop. Architecturally the Dorridge organ was a direct derivative from twentieth-century Scandinavian prospects, such as in the Danish Seamen's Chapel, London.[560] The organs were tuned in an unequal circular temperament, said by Tagliavini to be of early Italian origin, and in practice similar to the van Biezen temperament.[561] The installation of these Italian organs was due in part to Andrew Williams, then studying in Italy, who drew the attention of the Roman Catholic Organ Advisory Group to the recent work of Tamburini, and in part to a desire on the part of the writer to take up the points made by Andersen that the Italian organ was _the_ liturgical organ, and that, in striving for a "more honest" instrument in the Catholic Church, "the old organs of Italy will certainly form the point of departure."[562]

1978 saw consolidation of the work of John Mander with organs from World's End Church, Chelsea,[563] the Second Church of Christ the Scientist, Edinburgh,[564] and Kingston on the Hill Roman Catholic Church.[565] The Edinburgh and Chelsea organs were essentially 'repeats' of the Mellor organ, the Edinburgh organ shorn of the _Brustwerk_ 8' reed and Pedal Flute 4'; in the Chelsea organ only the _Brustwerk_ reed was absent. At Chelsea the architect of the new church was influential in softening the hard and undistinguished box-like outline of the Mellor organ by using curves, taken from the shape of the church windows, above the towers and flats.[566] The Mander 'standard console' is however all too evident. Overall the Chelsea organ demonstrated a better quality of finish than the earlier organs. This said, the organs for Mellor, Edinburgh and Chelsea were still very much a 'batch', a fact which makes the high prices charged by Mander (Chelsea 1978, £15,868)[567] a matter for note, especially when compared with Sandiacre which had two cases, (Church, 1977 £14,493)[568] Reading (Tamburini, 1977, £10,000)[569] and Blackheath (Freiburger Orgelbau, 1978, £12,000),[570] all ten-stop organs, other than Blackheath, which had two additional 'half-pulls', 1 1/3' and 2 2/3', from the Mixtur and Sesquialter.[571]

A variant of the Mander box style case was that of the five-stop, one-manual organ at Kingston on the Hill. This organ was better proportioned, being on the gallery rail in _Rückpositiv_ position, and enlivened visually by pipe shades designed by John Mander. Several developments are

S^t. Ann RC Kingston Hill		C-g'''	

	C		c		c'		c''		c'''		g'''		
Chimney Flute 8' ϕ mw	130 1/4		84		53.5		33.5		20		15.4		35% tin 1-12 std
Chimney ϕ L			18. 200		12.5 98		9 48		5 25		4 10		
Principal 4' ϕ mw	88 1/4		52.5		32		19		11.3		8.2		1 HT taper 75% tin
Nason 4' ϕ mw.	69 1/4.5		48.5		33		21		12.7		9.6		35% tin
Recorder 2' ϕ	33/55		21/34		14/22		12/15		9/10		8.5		35% tin
Mixture IV 2' ϕ mw	2' 46 1/4	1' 29.5	1/2' 18.5	1/4' 11.5	1/8' 6.8	1/16' 4							
		Mixture composition											
Mixture C gs e''	2 2 2/3 4	1 1/3 2 2 2/3	1 1 1/3 2	2/3 1 1 1/3									

Source: Information given by John Mander at the time of construction and in subsequent discussion.

noticeable in this little organ: the use of a 'flexible' wind system, with 'wedge' bellows (a wind supply regarded as too unsteady by Noel Mander),[572] the use of a temperament after Silbermann (1/6 comma meantone),[573] and the employment of a complex form of suspended action (Appendix D, 74, 75), especially problematic in circumstances where the windchest was lower than the keyboards. The scales (Table VII/20), were large, especially the Chimney Flute, and the sound was somewhat fulsome, reflective of the von Beckerath tradition. The scales were closely related to those of the Chelsea organ; the Stopped Diapason being of larger scale in the bass and smaller in the treble, the 4' and 2' stops being almost the same. The large scales in the bass were designed to provide a firm foundation to the organ in the absence of a Subbass. The Mixture was pitched at 2', to give an ample chorus from 8' - 2/3', the 2' rank being of especial significance when coupled to the Pedal, the first break being at g. The use of a 2' Mixture also allowed the Recorder 2' to be a wide scale stop, thus enriching the tonal variety of the organ, and removing any element of hybrid or compromise at this pitch. The scales by John Mander at Kingston are in considerable contrast to those of his father, as seen at the St. Paul's Boy's School (Table VII/8). The keyboards, with satinwood naturals and box sharps, were made by Monnington and Weston, and the pipes by Pipecraft (Norwich), a firm regularly used by Mander. The overall finish of the organ was however excellent, - nevertheless at a cost of just over £8,000 the organ was not inexpensive.[574]

On a larger scale was Mander's rebuilding, with mechanical action, of the England organ in St. James's Church, Clerkenwell. The majority of the England organ pipes and case remained and was completed to give the following stoplist:

St. James', Clerkenwell: Mander 1978[575]

Great

Open Diapason	8	E
Stopt Diapason	8	E
Principal	4	E
Flute	4	E
Twelfth	2 2/3	E
Fifteenth	2	E
Larigot	1 1/3	
Fourniture IV-VI		
Cornet V (mid C)		
Trumpet	8	

Swell

Open Diapason	8	E
Chimney Flute	8	E
Principal	4	E
Fifteenth	2	E
Twenty Second	1	
Cornet II		
MixtureIII		
Bassoon	8	

Pedal

Open Diapason	16	
Bourdon	16	(G & D)
Principal	8	(E in part)
Trombone	16	(G & D)

Note: E = England pipework
G & D = Gray and Davison pipework

The specification, however, lacks historic precedent, the mutations seemingly aimed at a 'tinkly' performance of trios.[576] The action made no attempt at historic reconstruction, being composed largely of standard trade parts, though the console in 'period' style, was "a thing of beauty and joy to sit at,"[577] and the overall finish and workmanship were described by Clutton as deserving "the highest possible praise."[578]

In contrast to the box style cases of John Mander, Peter Collins' asymmetrical case for Dundee University Chaplaincy[579] showed more architectural character, making full use of the interplay between the opposing five divisions of the 'Scandinavian prospect', in fourths, with the horizontal mouth line and sloping roof lines. After the large organs of Southampton and Dorchester, as also the export of two organs to Australia,[580] the Dundee organ showed a sound handling of design, building, and finishing of the organ. In even sharper contrast to the work of Mander was Collins' organ for St. Mary's, Paddington Green, London.

St. Mary's Church, Paddington Green, London: Collins, 1978[581]

Great		Choir	
Open Diapason	8	Chimney Flute	8
Stopped Diapason	8	Principal	4
Principal	4	Twelfth	2 2/3
Flute	4	Fifteenth	2
Fifteenth	2	Tierce	1 3/5
Mixture II-IV	1 1/3	Two and Twenty	1
Trumpet	8	Hautboy	8
Tremulant		Tremulant	

Pedal	
Bourdon	16
Principal	8
Gemshorn	4
Bassoon	16

In this simple Georgian church of 1791 Collins provided a neo-Georgian case, reminiscent of the work of England (e.g., Blandford Forum), in which all severity of angle was softened, and with tonal qualities of equal softness and sweetness. Here the case, and to a lesser extent, the stoplist, was not only an attempt to relate to the architecture of the church (whilst acknowledging classical ideals), but was also an acknowledgement of the developing interest in the historic English organ, an interest emphasised by the growing influence of the British Institute of Organ Studies, founded in Cambridge in 1975.

Examination of the organ, however, shows that the clearly conscious historicism of the case, stoplist, and soft voicing is not consistent throughout. The Choir was in fact an Oberwerk with effectively a Cornet Separée, topped by a Two and Twenty, and Hautboy 8' - English precedent for this is not easy to see. The absence of a 4' stopped flute on either manual is most un-English, and especially so on the Choir. Similarly uncharacteristic is the lack of a Great Twelfth. The scales (Table VII/21), do not have any historic basis, and are derivative from those of Henley. The Pedal Principal 8' was derived in part from the Great Open Diapason, and the whole of the Pedal organ is disposed in the side towers, a far cry from the English Pedal-less organ, Pedal pull-downs, or later Pedal pipes, placed at the rear of the case. The winding was from a single wedge-bellows placed under

Table VII/21

Paddington Green	Great	C–g'''	WP 60 mm

	C		c		c′		c″		c‴		g‴		
Open Diapason 8′ ϕ mw	130 106		73 53		44·5 32·5		26·5 20		16 12·5		12 9·5		1–29 70% tin 30–56 20% tin Ears 1–56 Languid 70° overlength used in prospect
Stopt Diapason 8′ ϕ	95 x 75		54 x 45·5		42 x 31		30 x 22		20 x 16·5		17 x 14		As RSCM and Henley
Principal 4′ ϕ mw	75 59		46 35		28 21		16 12		10 8		7·5 6		1–36 20% tin 37–56 75% tin Ears 1–37 Languid 70°
Flute 4′ ϕ mw	80 49		58 36·5		36 22·5		23 15		15 10·5		11·5 8		open 20% tin Ears 1–12 Languid 60°
Fifteenth 2′ ϕ mw	45 31·5		27 19		16 11		10 8		6·25 5		4·75 3·75		1–30 20% tin 31–56 70% tin Ears 1–24 Languid 70°
Mixture II–IV 1⅓′ ϕ mw	29 33		18 14		11 8·5		7 5·5		5 4·25		4 3·25		70% tin Languid 70°
1′ ϕ mw	24 19		15 12		9 7		6 5		4 3·5		7 6·25		70% tin Languid 70°
2′ ϕ mw			24 19		15 12		9 7		6 5		4·75 4		70% tin Languid 70°
2⅔′ ϕ mw					18 14		11 8·5		7 5·5		5·75 5		70% tin Languid 70°
Trumpet 8′ ϕ	75		60		46		42		38	cs″ 42	40		70% tin

Table VII/21

Paddington Green	Choir	$C-g'''$	WP 60 mm

	C		c		c'		c''		c'''		g'''		
Chimney Flute 8' ϕ mw	110 87	Fs 56	70 54		45 30		29 20.5		18 13		15 11		1-18 std. 20% tin Languid 50°
Chimney ϕ L		10 80			9 65		7 47		5 35		4 30		
Principal 4' ϕ mw	80 56		49 34		30 20		18 12		11.5 8		8.75 6		20% tin Ears 1-36 Languid 60°
Twelfth $2\frac{2}{3}$' ϕ mw	64 39		39 24		24 15		15 10		9 6		7 5		1-30 20% tin 31-56 95% tin
Fifteenth 2' ϕ mw	47 31		28.5 19		17 10.5		11.5 7.5		7 5		5.25 4		20% tin
Tierce $1\frac{3}{5}$' ϕ mw	48 28.5		29 18		17 10.5		9.5 6.5		5.5 4		4.5 3.5		1-30 20% tin 31-56 95% tin Ears 1-18 Languid 70°
Two and Twenty 1' ϕ mw	32.5 17		19.5 11		12 7.5		7.5 6		5 4.25		4.75 4		1-24 20% tin 25-56 95% tin Languid 70° Very low cu in treble.
Hautboy 8' ϕ	90 x 45		80 x 40		66 x 30		56 x 28		54 x 27.5		48 x 24		Wood

Table VII/21

Paddington Green	Pedal	C-f'	WP 60 mm

	C		c		c'		f'	
Bourdon 16' ϕ	181 x 145		112.5 x 90		70 x 56		57.5 x 46	Mahogany and pine. As Malvern (Australia)
Principal 8' ϕ	(130)		(73).	ds 65	44.5		36.5	20% tin 1-15 transmission from Gt. Op. Diap. Ears 16-70 Languid 70°
mW				47	32.5		26.5	
Gemshorn 4' ϕ	40/90		24.5/55		14.5/32.5		11.5/26	20% tin
mW	71		43.5		25.5		20.5	
Bassoon 16' ϕ	70 x 70		56 x 56		44 x 44		38 x 38	Wood

Mixture Composition

Mixture II-IV C	1 1/3	1		
c	2	1 1/3	1	
c'	2 2/3	2	1 1/3	1
cs'''	4	2 2/3	2	1 1/3

Source: Paddington Green file at P.D. Collins and discussions with P.D. Collins.

the gallery floor behind the case. The chracteristic 'standard' Collins II-IV Mixture as at Henley, lacked any real breaks and, with its addition of ranks at c and c', both overburdened the mild principals and accentuated, as indicated by Russill,[582] the treble/bass imbalance of the organ. Collins' continuing reaction against his early sharp 'Riegerish' sound, as at Shellingford, is very evident in the mild, nicked and foot-regulated voicing of this organ. Nor is it clear how far the use of low tin contents in parts of the registers (as at Henley), was a conscious part of the tonal softening, or a matter of economy - high tin content only appearing in short pipes. This latter would account for lack of blend. Far from being an organ with a real historical basis, it emerges as an organ in which "the overall design grows not so much from the character of the voicing, nor from the interesting situation but from a possibly over-anxious desire to ensure a wide repertoire for the instrument."[583]

Whilst the work of Collins was beginning to show a slightly less settled sense of direction, Nigel Church continued to gain in security. In the King's Hall of the University of Newcastle-upon-Tyne, in 1978, with Donald Wright as adviser, Church built a straightforward two-manual organ of ten stops.[584] Architecturally it was marred by an unsuccessful attempt on the part of the architect Bruce Allsopp to harmonise the case design with details of the architecture of the Hall, by a lumpy spotted-metal front from Rogers, and by insufficiently carefully selected materials (these latter the result of an inadequate budget, a mere £11,280).[585]

Church's next organ, for Coxwold Parish Church[586] represented a further advance in his work. Tonally it was more consistent and characterful, and mechanically more reliable. The overall woodwork finish was in the same style as Sandiacre, but with the handling of woodwork detail and workmanship again improved. The case architecture designed by Church in conjunction with the York architect Ronald Sims, successor to George Pace, who also designed the pipeshades, drew its inspiration from the shape of the hatchments hung in the church.[587] The simple disposition put the two manuals in a good relationship, even though there were only seven manual stops. The organ still retained a tendency to over-loudness and sharpness, but the sound was more controlled than

Table VII/22

Coxwold	Great	C–g'''	

	C	c	c'	c''	c'''	
Chimney Flute 8' ø	npta	74·4	45·3	27·6	17	Bass in Wood
mw	1/4					
cu	c.1/3					
Principal 4' ø	76	45	27	16·3	11	
mw	1/4					
cu	c.1/4					
Mixture III 1' ø	22					
	npta					
	npta					
		Chair				
Gedackt 8' ø	67x85	41x52	25x31	14·5x18·5	9·5x12	
cu	c.1/3					
Flute 4' ø	70	50	31·5	19	npta	
mw	1/4					
cu	c.1/3					
Principal 2' ø	42	24	15·6	9·3	6·3	
mw	1/4					
cu	c 1/4					
Sesquialtera II 2 2/3' ø		15/44	9/27·5	6/17·4	5/11	
mw		2/9				
cu		c. 1/3				
Sesquialtera II 1 3/5' ø		23	14	8·8	5·4	
mw		1/4·5				
cu		c.1/3				
		Pedal				
Subbass 16' ø	Secondhand – "medium to narrow scale".					

Source: Scale sheets by N. Church and discussions with N. Church at Marske and Long Eaton. This was due in part to the greater use of foot-control and reduction in foot-hole size - a similar tendency to that shown in the work of Collins - and also to the insistence of the Diocesan Adviser, Geoffrey Hunter, on the need for a well-blended sound.[588] Also, like Collins at Henley, Church used centre-less backfalls. The scales are given in Table VII/22 and the drawings in Appendix D, 76-77.

What of the remaining English builders? In St. Phillip's Roman Catholic Church, Finchley, ten Bruggencate built a two-manual organ of only seven stops.[589] The style remained very much that of Metzler (Appendix D, 78), architecturally it was in fact a straight copy of the Choir Organ of St. Joriskerk, Amersfoort (Appendix E, 39), on which ten Bruggencate had worked when with Metzler.[590] Financial pressures, arising from working on too tight a budget (Finchley cost only £8,220)[591] were becoming evident and the finish, while good and characterful overall, showed signs of haste in the selection of materials and in the execution of the case, action and voicing. These trends evident at Finchley, showed even more in what was a less well made and finished organ in St. Mary's, Far Cotton, Northampton.[592] Here the attempt to ally the 4' 'Amersfoort' prospect to a 2' Brustwerk was manifestly unsuccessful.[593] These two organs were effectively the last organs to be completed by ten Bruggencate, whose deteriorating financial position caused organs begun by him for Bellshill Roman Catholic Church and Gordon Frier, of Glasgow, to remain unfinished. His demise was further brought about by the removal of pipework by him from the Grant, Degens and Bradbeer organ in Dunchurch in 1980 (in the building of which he had been involved), in an attempt to complete the organ for Bellshill, followed by prosecution for theft,[594] which resulted in a cessation of his work, a sad pass to reach for a craftsman with ability.

At Poulton-le Fylde Roman Catholic Church Hindmarsh completed in 1978 a one-manual and pedal organ of six stops,[595] but the church had waited some four years for the construction of this small organ, the contract having been signed in April 1974.[596] The organ was certainly well made, finished and voiced, yet the delays over completion emphasised the small-scale, unhurried approach of Hindmarsh. Nearby, in Lancaster

University, Bishops built a two-manual organ of seventeen stops.[597] A comparison of this concert-hall organ with that by Collins at Southampton demonstrates only too clearly how the older established firms had failed to develop. Here at Lancaster, Bishops, the oldest extant firm in English organ building, even with Downes as adviser (who thought the organ "a very musical instrument"[598]), effectively failed to meet the challenges of building a classical organ; it was markedly lacking in the qualities of material, design and finish to be found elsewhere in England and Europe. Indeed its prospect rivalled Ealing Abbey as the most undistinguished of any organ of the classical revival in England.[599]

As with previous years, 1978 had its quota of imported organs. The one-manual Italian organs for Thatcham Roman Catholic Church[600] and Douai Abbey, Berkshire,[601] a two-manual organ from Freiburger Orgelbau for Blackheath Roman Catholic Church,[602] a practice organ from Gerhard Hradetzky for the Royal Scottish Academy of Music [603] (where David Lumsden was Principal), and also in Scotland, a two-manual organ by Ahrend for Edinburgh University.[604] The Tamburini organ for Thatcham was a repeat of the Dorridge organ.[605] In contrast to its contemporary style, the organ for the monastic choir of Douai Abbey was a conscious attempt at an historical style case in oak (Appendix D, 80). Here Tamburini were not entirely successful in matching the simple Italian organ of tradition to the Gothic style three-tower case, and the mix of casework moulding styles was especially unhappy. The restrictions in space imposed by the case gave Tamburini considerable difficulty in terms of chest layout, a matter not helped by the requirement of the monks for a 16' Pedal Subbass. In terms of material, hammered metal was used for the lowest octaves of all metal stops, other than the Principale 8' in prospect. The use of high tin content for the prospect and low tin content for internal pipes was characteristic of old Italian organs.[606] The principal scales were derived from those of the 1581 organ by Antegnati in St. Giuseppe, Brescia,[607] but Tamburini seems not to have noted the fact that the pitch of the Antegnati organ was "a good semitone above a'."[608] making the actual scale at Douai effectively a half-tone narrower in relation to today's pitch. The scales (Table VII/23), also narrow more markedly in the treble than do those at Brescia, indeed the Octava 4' almost halves

Table VII/23

Douai Abbey - Choir Organ	Manual	C–g'''	WP c.38-40 mm

	C		c		c'		c''		c'''		g'''		
Principale 8' ϕ	82x 70	F 120	80		44		26		14		10		60% tin in prospect, C-E from Bordone 8'
mw		88	60		32		18		11		8		
cu		19	13		8.5		5		2.5		2		
Ottava 8' ϕ	72		42	e 35 gs 28	21		12		7.5		5.5		25% tin
mw	53		27		14		10		5.6		4		
cu	12		8		3.5		2.5		1.5		1		
XV 2' ϕ	42		20		12		7.5		4.5		4		25% tin
mw	28.5		15		10		6		3		3.25		
cu	8		4		2.5		1.25		1		1		
XIX 1⅓' ϕ	30		15		9		6		3.5		3		25% tin
mw	20		11		8.5		5		3		2		
cu	6		3		1.75		1.5		1		1		
XXII 1' ϕ	20		12		8.5		5		5		6		25% tin Breaks back an octave at cs'' cs'''
mw	14		10.5		6		4		4		5		
cu	4		2		1.5		1		1		1.25		
Bordone 8' ϕ	82x 70		60		35		25		10/22		9/18		C–c wood remainder 25% tin tapered from c'''
mw			45		29		20		13.5		10.5		
cu	npta		17		10		6		4		3		
Flauto Camino 4' ϕ	70	B 45	42		28		17		12		6/9		25% tin Chimneys C-B 'bombiert' deckel C–c''' tapered from cs'''
mw	52	34	35		23		13		9		6		
cu	19	13	12		7		4.5		2		1		
Chimney ϕ	10	10	29		18		13		9				As in S. Alessandro, Bergamo, 1783.
l	120	65	80		40		30		10				
			Pedal										Note: Languid c. 75° on principals.
Subbasso 16' ϕ	c.225 x 215		c.140 x 130										Measures from Dwg. (App. D.79). Pipes inaccessible

Source: Measurements taken by the writer and John Budgen 16:11:82.

on the octave between c and c'. The Flauto Camino 4' has normal chimneys from C - B but from c - c''' has a soldered-on chimney in Cullote à biberon form,[609] the chimney diameter being around three-quarters that of the pipe diameter. The stop was derived from one of 1783 by Serassi, in St. Alessandro, Bergamo.[610] Another noticeable Italian feature was the large, bulbous feet of the small metal pipes. The rackboard is however not in the old style (above the pipe mouths), but below, and the 1 1/3' rank does not break back, as in Brescia.

The original Bordone 8' treble pipes were of late 18th-century Italian origin and of thin-walled chestnut, and (from c) were placed on a small chest behind the music desk, with hand-operated sliding doors (Appendix D, 79). The lack of blend however between the Bordone in this position and the remainder of the pipework led to its being replaced by a new metal Bordone 8' treble, mounted on three small chests in the towers. Despite the low wind pressure, some 38 - 40 mm, the organ sound, with very light nicking and virtually open-foot voicing, proved too loud for the monastic office in choir, filling the large volume of the Abbey Church with a silvery, unforced sound - something it was not intended to do, its function being the accompaniment of the office in the choir. The result was that the organ was softened by closing the pipe feet and flues, and by making between two and seven heavier nicks over the original light nicking. The temperament was unequal, being described by Tamburini as one common in Italy and favouring the church modes[611] (see also Chapter VIII). The organ was initially winded from two small wedge bellows placed in the base of the case beneath the chest. The amount of wind flexibility, whilst of great expressiveness in the hands of a fine player, proved too much for the monastic organists (especially in the early morning offices!) and was replaced by a spring-loaded box bellows. The final result was an organ which suited the monks well, having a firm, though ethereal, character.

Whilst the Douai organ lacks total conviction in stylistic terms, it has been well received, being regularly broadcast by the BBC and it has been used in teaching students from the Royal College of Music, and Guildhall School of Music (who made day visits with Nicholas Danby). Clutton described the organ as "everything a single-manual organ should, or can, be and everything any country parish can need and (at that price, £10,300), can afford."[612] It is also interesting to compare the submissions of Tamburini and Rushworth (to whom the monks were very well disposed), to see the extent to which an established firm seemed quite unable to grasp opportunities[613] (Appendix D, 81).

Also showing a move towards historical style was the Freiburger Orgelbau instrument for St. Mary's Roman Catholic Church, Blackheath,[614] with its simplified north-German, Hauptwerk/Brustwerk case. The Brustwerk, was, however, an Echo organ containing a Cornet decomposé in 'French' style and French influence was apparent in the use of the tremblant doux, and suspended key action. The organ employed a simple form of flexible winding with a 'pan' reservoir, and was tuned in Kirnberger III. The growing trend towards building in historical style, seen throughout Europe in organs such as the Schnitger (Uithuizen 1701) copy of 1973 by Reill at Scheveningen,[615] or the Bédos style organ at Sarre-Union of 1968 by Koenig,[616] and to a lesser extent in the Collins, Freiburger Orgelbau and Tamburini organs discussed above, was confirmed in the British Isles by the installation of the Reid Hall organ in Edinburgh University. Here was the first real challenge, in terms of a totally new organ, to the Queen's College organ of some thirteen years earlier.

Reid Hall, Edinburgh: Ahrend, 1978[617]

Hauptwerk		Rückpositiv	
Praestant	8	Gedackt	8
Rohrflöte	8	Praestant	4
Octave	4	Rohrflöte	4
Spitzflöte	4	Waldflöte	2
Nasat	3	Quinte	1 1/3
Octave	2	Sesquialtera II	2 2/3
Mixtur IV-V	1 1/3	Scharff IV	1
Trompete	8	Dulzian	8

Pedal	
Subbass	16
Octave	8
Octave	4
Posaune	16
Trompete	8

Table VII/24

Reid Hall Edinburgh	Hauptwerk	C–g'''	WP 63 mm

	C		c		c'		c''		c'''			
Praestant 8' ϕ	130		77		46		26		16			
Hohlflöte 8' ϕ	105.3		71.3		46.2		29.9		19.3			
Octave 4' ϕ	77.7		46.2		25.2		15.5		9.7			
Spitzflöte 4' ϕ	90.5		67		40		27		18			
Nasat 3' ϕ	36.5/73		25.8/43		17.7/26		13/18.2		8/11.4			
Octave 2' ϕ	44.2		24.1		14.9		9.3		6.3			
Mixtur IV–VI 1' ϕ	24.1		14.9		9.3		6.3					
Trompete 8' ϕ	110		85		60		53		50			

Table VII/24

Reid Hall Edinburgh	Rückpositiv	C–g'''	WP 63 mm

	C		c		c'		c''		c'''			
Gedackt 8' ϕ	65/110		66		46		29		20			
Praestant 4' ϕ	77		46		26		16		10.2			
Rohrflöte 4' ϕ	65.3		42.3		28.7		18.6		12.6			
Waldflöte 2' ϕ	54.9		32.6		19.3		13.7		9.3			
Quinte 1⅓' ϕ	Scale as HW Octave 2'											
Sesquialtera II 2⅔' ϕ	Scale as HW Octave 2'											
Scharff IV 1' ϕ	Scale as HW Octave 2'											
Dulzian 8' ϕ	47		33.5		27.5		24.5		22.5			

From g

Reid Hall Edinburgh	Pedal	C–f'	WP 63mm

	C		c		c'		f'	
Subbass 16' ϕ	187×150		128×92		84×58			Wood
Octave 8' ϕ	136·5		82		48			
Octave 4' ϕ	77·7		46·2		27·4			
Posaune 16' ϕ	68		57		47			
Trompete 8' ϕ	125		95		68			

Mixture Compositions

Mixtur IV–VI C	1⅓	1	⅔	½		
cs	1⅓	1	1	⅔		
fs	1⅓	1⅓	1	1		
cs'	2	1⅓	1⅓	1		
fs'	2	2	1⅓	1⅓		
cs''	2⅔	2	2	1⅓		
fs''	2⅔	2⅔	2⅔	2	2	
cs'''	4	4	4	2⅔	2⅔	2⅔
Scharff IV C	1	⅔	⅔	½		
cs	1⅓	1	1	⅔		
fs	1⅓	1⅓	1	1		
cs'	2	1⅓	1⅓	1		
fs'	2	2	1⅓	1⅓		
cs''	2⅔	2	2	1⅓		
fs''	2⅔	2⅔	2	2		
cs'''	4	4	2⅔	2⅔		

Source : Details given by J. Ahrend in a

In all ways the organ demonstrated again the elegance and simplicity exemplified up to this point only by the Queen's College organ, indeed, perhaps more so. It had a simple Hauptwerk/Rückpositiv disposition, the Pedal Organ (except for the lower part of the 16' Subbass, which was hung on the rear of the case), being housed in the main case. Architecturally the mild, pedimented classicism matched perfectly, in proportion and detail, the cool elegance of the Hall. The traditional oak panelled construction was substantial, the shades were similar to those of the 1961 Ahrend organ in Aurich.

The simplicity of the organ was remarkable: it employed only two couplers, Rückpositiv to Hauptwerk, and Hauptwerk to Pedal, the manual coupler being a slide,or Scheibe,coupler. The action was of wood, suspended, the trackers running direct, via a roller-board, to the pallet; the Rückpositiv action ran downwards from the middle of the key via a backfall, to the pallet, which was pushed open upwards (Appendix D, 82). The simplicity of the action was matched by both the stoplist and scaling. The stoplist had no extreme or unusual voices, and the mixtures (both having breaks at c and f sharp), were straightforward, their general pitch being kept low though with doubled ranks at all stages from the first break upwards (see Chapter VIII). The scaling (as Table VII/24 shows) had a similarly basic approach, similar values commencing around -4 to -5 HT being employed for all principal stops, and all principal stops above 2' pitch, including the Sesquialtera, having the same scale. Mouth-width and cut-up appear, from visual inspection, equally straightforward, around 1/4 for principals. The voicing was bright, indeed brilliant, but with no trace of anything other than a singing quality, and the temperament was Werckmeister II. Wind supply was by a wedge bellows, some two metres long, placed in the gallery on the bass side of the case. The pedal board, on the front of the case, was a flat 'Schnitger' style board. The phrase "the simple organ" coined by Peter Williams in his lectures at the Royal College of Organists in 1969 had, in the Edinburgh organ, been given breath and brought to life.

Such simplicity did not pass without comment, much of which was directed towards the console arrangements: the manual-pedal-seat relationship (Appendix D, 82), was described by Clutton as being "such that some players find the organ cripplingly uncomfortable to play" though he did find the action "superlative."[618] Needless to say the placing of the Rückpositiv stop knobs in the Rückpositiv case rear was criticised by Clutton.[619] Clutton did, however, make one remark of perhaps more significance: after describing the organ as "very musical", he went on to comment that "legitimate criticism of the organ is likely to debate as to whether or not it conforms with its self-appointed disciplines."[620] Now Ahrend's philosophy is clear, that of a return to historical tradition in all aspects of organ building:[621] Williams' philosophy is similar, suggesting that "in the past lies the future of the organ."[622] He describes the Reid Hall organ as "a kind of NW German - Lutheran of c1700, useful for the Bull - Buxtehude period in particular."[623] Additionally he has stated that his "paramount requirement" was "excellence of action, even before tone and specification",[624] and that "in his opinion the best suspended tracker action was made by Ahrend, and the job of building the organ was given to him."[625] Williams was also "very keen to get a properly made Rückpositiv, the first ever built north of Durham?"[626] While the general historical roots of the organ seem clear, until Williams (and Ahrend) go further than the comments above, discussion as to conformity with its "self-appointed disciplines" is likely to be less than profitable.

In the last year of the decade neither Collins nor Mander built any organs in England. Both builders were, however, exporting a number of instruments, Mander to the sheikdoms of the near East,[627] and Collins to Australia,[628] where a thriving organ revival had begun. At the same time, growing economic recession had also led to a slowing down of work in general in Britain. In these circumstances it is not surprising that the work of Church came to the fore. In economic terms his workshop was situated in a development area with grant-aid to industry, ready availability of skilled labour, and low overheads. Up to this point his work had shown steady development, growing consistency in his actions and improved tonal and architectural design. To some extent his development was both enhanced and limited by his location in a (comparatively) remote part of England. Impetus was given to his development in 1977, when the ex-cinema organ in Wallsend on Tyne Catholic Church was irreparably damaged by flood water. The parish priest called in the Organ Advisory Group and, as the ex-cinema organ had been adequately insured, the immediate discussion was over choice of builder for a new organ. While Church's work was seen by members of the Group as satisfactory, equally his work was thought of as still in the early stages of development, and lacking in the quality that ought to be expected in the building of new organs. In order to support local initiative, but also to ensure a result of predictably good quality, it was suggested by the writer (as Honorary Secretary of the Organ Advisory Group), that Church should be commissioned to build the organ, but in consultation with George Lhôte of Geneva. Lhôte was a partner in Neidhart and Lhôte of St. Martin, Switzerland, who had built significant organs such as Romainmotier (1972), St. Peter, Basel (1968), and the Matthaus Kirche (1971), Lucerne; he was also a designer and voicer, who had worked for many years free-lance for other European builders, notably Rieger (as in the case of Clifton Cathedral), Verschueren and others.[629] This procedure was agreed to by both the parish and Nigel Church.

Our Lady and St. Columba's Roman Catholic Church, Wallsend: Church, 1979[630]

Great		Choir	
Principal	8	Gedackt	8
Octave	4	Chimney Flute	4
Fifteenth	2	Nazard	2 2/3
Nineteenth	1 1/3	Flute	2
Mixture II	1	Tierce	1 3/5
Pedal			
Subbass	16		
Open Flute	8		
Trumpet	8		

The result was another expression of the 'simple organ', this time deriving its design from a combination of historical awareness and liturgical needs. Where the Ahrend organ at Edinburgh was a conscious exercise in utilisation of historic style and discipline, the Wallsend organ sprang more from a creative preoccupation with the past, which was drawn upon to fulfill the liturgical needs of the present. The

Wallsend RC	Great	C–g'''	WP c. 55mm

	C		c		c'		c''		c'''		g'''		
Principal 8' ϕ	140x 103 (148)	DS 130	85		47		26.8		16.3		12.6		C–D in wood inside the case Pine rest 70% tin
mw		90	58.5		34		20.7		12.8		1/4		
Octave 4' ϕ	81		44		25.2		15.6		10		8.1		70% tin
mw	56		32.8		20		1/4		1/4		1/4		
Fifteenth 2' ϕ	42.5		24		15.4		9.7		6.8		5.7		70% tin
mw	1/4												
Nineteenth 1⅓' ϕ	32.6		18.6		11		7.4		5.5				70% tin
mw	23.5		14		8.7		1/4		1/4				
Mixture II 1' ϕ	23		14.5		8.5		6		4.6				70% tin
mw	1/4												

Mixture Composition

Mixture II 1' C	1	2/3
c'	2	1
f''	2 2/3	2

Table VII/25

Wallsend RC	Choir	C–g'''	WP c.55mm

	C		c		c'		c''		c'''		g'''		
Gedackt 8' ϕ	110× 76		63× 45		38× 28		25× 20		18× 16		15× 13		Mahogany
Chimney Flute 4' ϕ mw	71 1/4		40.5 1/4		26.3 1/4		16.3 1/4		11 1/4	cs''' 6/12 1/4.5	5/9.7 1/4.5		15% tin
Chimney ϕ l	14.5 190		10 110		7.6 68		5.8 40		4.7 23				
Nazard 2 2/3' ϕ mw	52 1/4	B 34 1/4	40 26		26.5 18.2		17.8 12.8		11 8.2		7.8 5.9		C–B std. 15% tin
Flute 2' ϕ	39/58		26/39		16/24		10.6/15.8		6/8.8		4/6		2:3 taper 15% tin
Tierce 1 3/5' ϕ mw	46 29		28.5 18.6		18.8 12.6		12.7 8.5		7.7 5.4		5.2 3.8		15% tin
			Pedal						WP 70 mm				
Subbass 16' ϕ cu	190× 163 c.45		121× 100 c.28		74× 61 c.17	f' 60 ×49 c13.5							
Open Flute 8' ϕ cu	142× 112 c.25.5		88× 66.5 c.15.5		60× 40.5 c.9.5	50× 34 c.7.7							
Trumpet 8' ϕ	120		92		72	66							French shallots sp.m.

Source: Scale sheets in the hand of G. Lhôte.

requirements of a responsorial liturgy, consequent upon the reforms of the Second Vatican Council, led to the adoption of a male/female relationship between the manuals, in conjunction with a supporting Pedal organ. The simplicity of the 'reformed' liturgy was also echoed in the deliberate use of a simple suspended key action, an action basically the same as in the old Italian organ, or as in the sixteenth-century organ in Oosthuizen, an organ described by Lhôte as "the most classical organ."[631] The case design was based upon old organs: Oosthuizen was again influential, but more so was Hombleux,[632] though for reasons of ceiling height and overall proportions the Principal 8' only went to E in prospect, the lowest notes being inside the centre tower in wood. The placement of both manuals on one soundboard, Choir behind Great, was dictated by the budget (the final cost was c. £18,000). The case was of mahogany on a steel frame, this latter to give maximum rigidity for action stability. The detail drawings and scales (Appendix D, 83-89), and Table VII/25, provided by Lhôte, were a revelation, not only to Church, but also to other builders who saw them at the 1979 British Institute of Organ Studies Conference in Newcastle. The combination of sound architecture and mechanical and tonal design by Lhôte, straightforward craftmanship by Church, and final voicing by Lhôte and Church proved successful, though the voicing was perhaps a little on the 'quick' side.

Church's output in 1979 was not, however, restricted to the Wallsend organ, for two one-manual and pedal organs were built in Anglican churches in Drax[633] and Redmarshall,[634] and a further two one-manual organs for Catholic churches in Hoveton and Beverley (Appendix A, 84). These latter had basically the same design, a simple 'Scandinavian' prospect in six groups of six, in augmented fourths (Appendix B, 10 and D, 90, 91, 92), and were again designed by Lhôte thus consolidating Church's experience with him. This broadening of experience, instigated by the Organ Advisory Group, was significant for Church who, having established his workshop and committed himself to fulfilling contracts, was not in a position to cease work in order to travel and study his craft further. Bringing Lhôte to work with Church thus provided an enrichment of experience 'on the job' without endangering the stability of his firm.

The influence of the Catholic Organ Advisory Group was also apparent in a small organ by Bishop's for St. Thomas Catholic Church, Grays. The church was a large neo-Gothic building in a poor area, and with limited resources. A one-manual and pedal organ was the maximum that could be afforded. The Lancaster organ by Bishop was not very encouraging but, as Bishops were in Brentwood Diocese, the decision was taken to employ them in the hope of their improvement, rather as had been done with Church. The individual personality of John Budgen, a senior partner and principal influence in Bishops, precluded the employment of a designer such as Lhôte. In order to control the direction of the work it was agreed to use Schnitger's scales from the seventeenth-century organ in Nieuw Scheemda, a small organ which had the task of filling a large church with sound.[635] The prospect was derived from that of an organ by Janke in St. Hedwig, Friedhof, Berlin-Reinickendorf. The organ had the following specification:

St. Thomas' RC Church, Grays: Bishop, 1979

Manual		Pedal	
Gedact	8	Bourdon	16
Principal	4		
Flute	4		
Twelfth	2 2/3		
Fifteenth	2		
Mixture III	1		

The result was an unpretentious organ, costing £6,500.

Another factor in 1979 was the re-emergence of J. W. Walker under Robert Pennells as builders of 'classical' organs. During the late 1970's Walkers began a sustained advertising campaign indicating their commitment to the building of mechanical-action organs. In 1976 a four-stop positive[636] and in 1977 a small two-manual practice organ for the Royal Academy of Music,[637] were built; this latter instrument was reminiscent of an organ by Kenneth Jones in Renmore, Galway who, as mentioned, had instruments built for him by Pennells. A distinct step forward was taken by Walkers in 1979 with the completion of two mechanical-action organs for St. Edward's Church, Romford[638] and St. Leonard's Church, Streatham.[639] The Romford organ contained some ten ranks of earlier Walker pipework, and was a rather characterless organ with a great deal of fussy architectural detail. Some of the lack of tonal character could be attributed to an over-deep case with the Swell placed behind the Great and some to the use of the old pipework. The Streatham organ carried rather more conviction, tonally more colourful, but with a less-than-subtle key action. Both organs lacked that adherence to discipline required in the layout of a convincing classical organ. At Streatham this was demonstrated by the placement of the chests effectively one behind the other, the Swell a little above, and the duplexing of the Great Principal 8' which led to the prospect pipes using pneumatic assistance. Clearly the ability to "hook a pallet to a key"[640] was not all.

In 1979, in Cambridge, under the guidance of Peter le Huray, William Johnson completed the building of a thirty-eight stop, three-manual organ, utilising the 1895 case (by Garner), in the Chapel of St. Catharine's College (Appendix A, 85). The pipework of the Swell, and much of the Great, was from a mid-nineteenth century organ by Bishop, Starr and Richardson.[641] The building of a new action and chests on this scale was an ambitious undertaking for a builder whose principal success had been in building box organs. Although the extent of old material employed places this organ in general outside the scope of this study, it is noteworthy for the amount of experimentation in relation to mechanical action undertaken by Johnson, prior to commencing the work.[642]

Imports were few in 1979: the fall in the value of the pound in the late 1970's and deepening economic depression were taking their toll. Organs were nevertheless imported from Tamburini for the Sacred Heart Roman Catholic Church, Mill Hill[643] (almost identical to that in St. James', Reading,[644] with the addition of a Cornamusa 8' on the second manual), and a one-manual for St. Ethelreda's Roman Catholic Church, Barking by the Freiburger Orgelbau (Appendix A, 86).

The remaining imported organ in 1979 was of far more significance; a four-manual instrument by Rieger for Christ Church Cathedral, Oxford. Where the organ for Clare College, Cambridge was the riposte to that for the Queen's College, Oxford, the Christ Church organ may be viewed as a reply to that of Trinity College, Cambridge. In broader terms, the Christ Church organ was confirmation of the general trend of classical development, a logical step from the organs in The Queen's College and New College. The particular significance of the organ lay, however, in the fact that it was the first new, classical, mechanical-action organ to be installed in a Cathedral of the established Church in England, albeit one in an Oxford College. While it remains for a Church of England Cathedral to install a new classical organ by a native builder (by 1979 there were already two in Catholic cathedrals),[645] the installation of the Rieger organ in Christ Church is almost as noteworthy as the building of the Frobenius organ in The Queen's College in 1965.

A new organ for Christ Church had been under discussion for some time; initially it was to have been built by Lawrence Phelps, of Eyrie, Pennsylvania. Financial difficulties with his business prevented him from building the Christ Church organ, even though the contract had been signed, and Phelps had begun to dismantle the old organ. The loss to the Cathedral in financial terms seems to have been considerable. The Cathedral Organist, Simon Preston, then visited the Rieger organ at Clifton, discussed the work of Rieger with the writer, and then visited more recent Rieger instruments in Austria, including that in the Augustiner Kirche in Vienna. These experiences, coupled with the reliability of Rieger, under Josef von Glatter-Götz, with regard to fulfilment of contracts, and the firm encouragement of the Dean, appear to have decided the placing of the order with Rieger.[646]

All that remained of the late seventeenth-century Christ Church organ by Bernard Smith was the upper part of the case, back and front. From the nineteenth century were extensions to the main case, and a Chair case by Gray from 1870. No early pipework survived and, despite the Smith case material, the decision was taken to build an organ rooted in the French tradition of Bédos, the stoplist satisfying the wishes of the Organist, Simon Preston, in terms of classical and romantic French organ music, and also the wish of the organ builder to build in the French style (Christoph Glatter-Götz (son of Josef), had just completed a translation of Bédos into German).

Christ Church Cathedral, Oxford: Rieger, 1979

Hauptwerk (Great)

Bourdon	16
Montre	8
Flûte à cheminée	8
Prestant	4
Flûte conique	4
Doublette	2
Cornet V	8
Fourniture VI	2 2/3
Cymbale IV	2/3
Trompette	8
Clairon	4

Rückpositiv (Choir)

Montre	8
Bourdon	8
Prestant	4
Flûte à fuseau	4
Cor de chamois	2
Sesquialtera	2 2/3
Larigot	1 1/3
Cymbale IV	1
Cromorne	8
Tremblant	

Schwellwerk (Swell)

Salicional	8
Voix Céleste	8
Flûte bouchée	8
Octave	4
Flûte	4
Nazard	2 2/3
Quarte de Nazard	2
Tierce	1 3/5
Plein Jeu V	2
Cor anglais	16
Voix humaine	8

Bombarde

Bombarde	16
Trompette	8
Clairon	4

Pedal

Montre	16
Soubasse	16
Flûte de pedale	8
Bourdon	8
Basse de chorale	4
Fourniture V	2 2/3
Basson	16
Trompette	8
Clairon	4

As shown in the drawings (Appendix D, 93, 94), the organ had four manuals and pedal: Great and Bombarde were placed on the same chest (in French style), in Smith's Great case; a new Chair organ was placed in Gray's Chair case; and a large Swell organ was put in the upper part of the foot of the main case - a solution which "has aroused strong partisan reactions."[647] The Pedal was placed in a separate case behind the main case, backed with Smith's west prospect of wooden dummy pipes. The final result was a rather tall organ in which the unrelated Smith

Figure VII/2

Christ Church, Oxford
Rieger, 1979

Christ Church Oxford	Great				C–c''''				WP 65 mm				
	C		c		c'		c''		c'''		c''''		
Bourdon 16' ϕ	185×140	B120×86	120		71		44.2		27		18		1–12 Oak remainder 50% tin
mw			90		53		33.3		1/4		1/4		
Montre 8' ϕ	155		88		50		30		19		12		75% tin 1–18 ears
mw	116		1/4		1/4		1/4		1/4		1/4		
Flûte à Cheminée 8' ϕ	130		74		45		28.6		19		12		50% tin 1–61 Ears 1–12 std
mw	1/4												
Chimney ϕ			18		12.3		8.5		6.2		4.3		
L			187		92		45		22		13		
Prestant 4' ϕ	86		47.5		28		17.4		11.5		7.8		50% tin Ears 1–12
mw	1/4												
Flûte Conique 4' ϕ	21/85		12.5/50		7.7/31		4.9/19.7		6/12		3.9/6.8		50% tin Ears 1–12
Doublette 2' ϕ	48		26.8		16.3		10.5		7.8		6		50% tin
Fourniture VI 2 2/3'	2 2/3'	2'	1'	1/2'	1/4'	1/8'	1/16'						75% tin
ϕ	56	45	25.2	15	9.3	6.8	4.6						
mw	1/4												
Cymbale IV 2/3'	1'	1/2'	1/4'	1/8'	1/16'								75% tin
ϕ	25.2	14	8.8	6	4.6								
mw	1/4												

Table VII/26

Christ Church Oxford	Great	C–c''''	WP 65 mm

	C		c		c'		c''		c'''		c''''		
Cornet V 8' ϕ mw			63 1/4		39		26		17.8		12		25% tin throughout.
Chimney ϕ l			16.5 178		11.3 87		7.8 43		5.6 21		4.3 12		Closed feet used throughout all ranks
4' ϕ mw			52.6 1/4.5		36		25.2		16.3		9.3		
2⅔' ϕ mw			46.2 1/4.5		30		20.5		13.1		7.1		
2' ϕ mw			38.8 1/4.5		26		17.8		10.1		5.2		
1⅗' ϕ			35.6 1/4.5		23.5		16.3		8.8		5.5		
Trompette 8' ϕ lower ϕ	110 14		84 12		68 10.5		56 9	6'' 50 8.5	mw	9''' 48 9s 13.7 1/3.5	12 1/3.5		50% tin 9s''' to c'''' flue pipes
Clairon 4' ϕ lower ϕ	75 12		66 10		9 58		8 50	9'' 48 8	11.5 1/3.5		7.1 1/3.5		50% tin 9s''–c''' flue pipes

Note: Full reed details in Appendix B 13.

Table VII/26

Christ Church Oxford	Choir	C–c''''	WP 50mm

	C		c		c'		c''		c'''		c''''		
Montre 8' ϕ mw	133 96		76.5 57		44 33		25.8 1/4		16.3 1/4		11 1/4		75% tin Ears 1-12 Closed feet
Bourdon 8' ϕ	100x79		Rieger scale			2A							Oak
Prestant 4' ϕ mw	81 58.5		46.2 34		25.8 1/4		15.6 1/4		10.1 1/4		6.3 1/4		50% tin Ears 1-12
Flûte à Fuseau 4' ϕ	47.5/95		32.5/65		19/38		12.5/25		6.6/15.2		4.5/8.9		25% tin Ears 1-12
Cor de Chamois 2' ϕ	17.6/53		12.8/32		10.3/20.6		6.9/13.7		5/8.6		3.4/5.2		50% tin Ears 1-12
Sesquialtera II 2 2/3' ϕ mw	57.4 36		34.8 24.3		23.1 17.3		15.3 1/4		8.8 1/4		5.5 1/4		50% tin
1 3/5' ϕ mw	38.8 20		23.6 14		15.6 11		10.3 8.1		6.1 1/4		3.6 1/4		50% tin
Larigot 1 1/3' ϕ mw	39 21.6		25.8 13.7		15.6 9.5		9 6.6		5.2 1/4		2.9 1/4		50% tin
Cymbale IV 1' ϕ mw	1' 23 1/4	1/2' 13.3	1/4' 8.1	1/8' 5.4	1/16' 3.8								75% tin
Cromorne 8' ϕ lower ϕ	34 14		30 12		24 10.5		25 9.5	fs'' 24 9		d''' 23 8.6	gs''' 12.6 mw 1/3.5	11.5 1/3.5	50% tin gs'''–c'''' flue pipes

Note: Full reed details in Appendix B13.

Christ Church Oxford	Swell	C–c''''	WP 60 mm

	C		c		c'		c''		c'''		c''''		
Salicional 8' ϕ	115		68·5		38		22		13·7		8·8		50% tin
mw	79		47		28		17		1/4		1/4		Ears 1-24
Voix Céleste 8' ϕ	115 x 90		50·5		31		18		11·4		6·8		50% tin C–B wood
mw			1/4·5										1–24 Ears
Flûte Bouchée 8' ϕ	120		74		45		28·5		18·6		14		25% tin Ears 1-24
mw	1/4												
Octave 4' ϕ	86		49		28		16·9		10·5		7·1		50% tin Ears 1-24
mw	64		1/4		1/4		1/4		1/4		1/4		
Flûte 4' ϕ	92		60		36		25·2		16·3		9·7		25% tin
mw	1/5												
Nazard 2⅔' ϕ	52	B 35	40		25·8		17·2		10·4		6·5		25% tin C–B std
mw	1/4		22·8		1/5		1/5		1/4·5		1/4·5		Ears 1-12
Quarte de Nazard 2' ϕ	39/60		25·5/39		17·3/25·5		11·2/17·3		7·5/11·2		4·5/7		25% tin
Tierce 1⅗' ϕ	30·3/50·5		19·8/33		12/20		7·8/13		4·4/7·4	g''' 5·3			25% tin From gs''' repeats at 3⅕'
Plein Jeu V 2'	2'	1'	1/2'	1/4'	1/8'	1/16'							75% tin
ϕ	44	25	14·5	8·8	6	4·2							
mw	1/4												
Cor Anglais 16' ϕ	100	B 80	100		70		60		40		30		50% tin
Voix Humaine 8' ϕ a	75		65	e 59 f 67	63		53		43	g''' 39 gs''' 13·7	12		50% tin C–e conical
b				22	19		14·5		10·5	9			gs'''–c'''' five pipes
c	14		12	11·5 10	9		8		7·5	7			f–g a/b/c

Note: Full reed details in Appendix B 13

As Augustinerk. Vienna. In fact an Hautbois

Christ Church Oxford	Bombarde	C–c'''	WP 65 mm

	C		c		c'		c''		c'''		c''''		
Bombarde 16' ϕ lower ϕ	110 18		90 14		70 12		57 10		50 9		48 8		50% tin C–Gs ½ L
Trompette 8' ϕ lower ϕ	95 16		78 13		65 11.5		54 10.5		48 9.5	gs''' 12 13.7 1/3.5	10.5 12 1/3.5		50% tin gs'''–c'''' flue pipes
Clairon 4' ϕ lower ϕ	81 14		70 12		56 10.5		48 9.5	gs'' 10.1 11.5 1/3.5	10.1 11.5 1/3.5		6.3 7.1 1/3.5		50% tin gs''–c'''' flue pipes

Note: Full reed details in Appendix B 13

Christ Church Oxford	Pedal	C – g'	WP 75mm

	C		c		c'		g'						
Montre 16' ϕ mw	280 205		155 117		85 1/4		62 1/4						75% tin Ears 1-24 In prospect
Soubasse 16' ϕ	210x 155		100x 79	Rieger scale ZA									Oak and Pine
Flûte de Pédale 8' ϕ mw	149 112		88.5 67.6		52 1/4		38.8 1/4						50% tin Ears 1-12
Bourdon 8' ϕ mw	130 1/4		74		47		35.6						50% tin Ears 1-20
Basse de Choral 4' ϕ mw	92 66		50 1/4		29 1/4		23 1/4						50% tin Ears 1-12
Fourniture V 2⅔' ϕ mw	2⅔ 60 1/4	2' 48.2	1' 29.3	1/2' 18.6	1/4' 11.5	1/8' 7.1							75% tin
Basson 16' ϕ lower ϕ	160 22		110 16		85 12		72 12						50% tin
Trompette 8' ϕ lower ϕ	130 17		92 14		76 11		68 9.5						50% tin
Clairon 4' ϕ lower ϕ	65 14		53 12		46 10		43 9.5						50% tin

Note: Full reed details in Appendix B 13

Christ Church Oxford	Mixture Compositions					
Great						
Fourniture VI C	2 2/3	2	1 1/3	1	2/3	1/2
c	2 2/3	2	1 1/3	1	1	2/3
c'	4	2 2/3	2	1 1/3	1 1/3	1
c''	4	2 2/3	2 2/3	2	2	1 1/3
gs''	8	4	2 2/3	2 2/3	2	2
c'''	8	5 1/3	4	2 2/3	2 2/3	2
fs'''	8	5 1/3	4	4	2 2/3	2 2/3
Cymbale IV 2/3' C	2/3	1/2	1/3	1/4		
B	1	2/3	1/2	1/3		
a	1 1/3	1	2/3	1/2		
e'	2	1 1/3	1	2/3		
b'	2 2/3	2	1 1/3	1		
fs''	4	2 2/3	2	1 1/3		
cs'''	4	2 2/3	2 2/3	2		
Choir						
Cymbale IV 1' C	1	2/3	1/2	1/3		
B	1 1/3	1	2/3	1/2		
as	2	1 1/3	1	2/3		
a'	2 2/3	2	1 1/3	1		
gs''	4	2 2/3	2	1 1/3		
e'''	4	2 2/3	2 2/3	2		
Swell						
Plein Jeu V C	2	1 1/3	1	2/3	1/2	
as	2 2/3	2	1 1/3	1	2/3	
gs'	4	2 2/3	2	1 1/3	1	
fs''	4	2 2/3	2	2	1 1/3	
cs'''	8	4	2 2/3	2 2/3	2	
Pedal						
Fourniture V	2 2/3	2	1 1/3	1	1/2	

Source: Rieger scale sheets and conversations with Josef, and Christoph, von Glatter-Götz at the time of construction and Gray cases sit in harmony, (Figure VII/2), well scaled to the building if somewhat overloud in the almost non-reverberant acoustic - a characteristic that becomes really evident when the organ is used un-idiomatically.

As Josef von Glatter-Götz has written, the organ had, as its basis, the Isnard organ in St. Maximin-en-Var. It was also considered (as with Phelps at Hexham), that the French style required "discipline whilst allowing most freedom for the player and composer,"[648] thus the organ was French "from nomenclature to scales, to the tiniest details of reed boots."[649] Equally, as Glatter-Götz also commented, the organ is "an Austro-British compromise: the stop action is strictly mechanical but there are pistons galore to move it electrically too"[650] - the English Cathedral tradition had had its say. The organ is, however much more a compromise in stylistic terms than Glatter-Götz indicated. Quite apart from the contradiction between the old German-Dutch style casework by Smith and the internal disposition, there is also the contradiction between the essential simplicity of the classical French suspended action and the twentieth-century, heavily-compensated, back-fall action employed by Rieger (Appendix D, 93, 94), and by the insertion of a large, eleven-stop, semi-romantic Swell above the keyboards - hardly an 'Echo'. Here, in this organ, the sophisticated engineering employed seems curiously at odds with the chosen style-aesthetic. In a similar manner 'quick' voicing of the principal choruses, which despite their professed 'French' style remain somewhat more Germanic than the reeds (where 'Frenchness' is not in doubt), could be seen as an area of compromise. The scales also (Table VII/26) indicate more adherence to standard 'Rieger' practice than might be expected - a matter discussed below in Chapter VIII. However, when seen against the muddled eclecticism of Mander and Wicks at Canterbury in 1979 (where the Willis organ of 1886, contemporary with Willis' 1884 organ in Christ church, was rebuilt with the addition of a neo-baroque positive organ in the style of the 1950's and 60's, pedal upperwork, together with a classically cased nave organ, all operated by electropneumatic action from a detached console within the choir), the Christ church organ appears a coherent, valid and effective solution. A solution considered by Clutton to be "liturgically acceptable, and as a solo instrument it is highly competent. Mechanically it is as perfect as anything one could imagine."[651]

The final year considered in this study, 1980, saw the by now well established pattern continuing, that of work being undertaken by both native and overseas builders. The only notable exception to the pattern being the absence of any work in England by Collins, all his production in 1980 being for export.[652] Planning for a fifty-four stop organ, with Downes as consultant, for St. David's Hall, Cardiff, was, however, also in progress.

Church continued his association with Lhôte and, with the writer as consultant, built a new organ for Bryanston School Church,[653] opened by Lionel Rogg on March 8, 1980. The school had taken over the old parish church of St. Martin from the diocese of Salisbury. Happily the diocesan authorities had removed a very undistinguished, and altered, Hope-Jones organ, thus enabling the school to have a free hand over the new organ. The Head of Music, Peter Latimer, was keen to have Church as builder and the involvement of Lhôte was considered by the writer to be of importance in planning this (relatively) large-scale organ. The siting of the organ was helped by the fact that, after a period of liturgical experiment, a new altar had been placed at the head of the nave and the choir had become accustomed to singing grouped in a semicircle behind the altar, facing west. Although unusual in England (other than in non-conformist chapels), it was a comparatively simple matter to place the organ centrally, under the chancel arch, and facing west (Figure VII/3), with the choir, and on occasion orchestra, grouped around the base of the organ. The brief for the organ was simple, it was for accompanying voices in worship and concert and for the performance of organ music. Its role in educating young musicians, many of whom took up organ scholarships in Oxford and Cambridge, was seen as of paramount importance.

The organ was given a straightforward Hauptwerk/Brustwerk disposition (Appendix A, 87) and the case was similar to that by Metzler in St. Alban's in Basel (Appendix E, 36). The relationship of the manual choruses, Great and Echo (which actually had Swell shutters), was that of male/female, or parent/child, not one of equality. The scales are given in Table VII/27 and constructional details in the working drawings (Appendix D, 96-105). The Pedal was placed in a separate case behind the main case but was given considerable strength and character by having full length reeds at 16' and 8' pitches and a chorus up to a three-rank

Figure VII/3

Bryanston: Church, 1960

Bryanston School	Great	C–g'''	WP c. 65mm

	C		c		c'		c''		c'''		g'''		
Principal 8' ϕ	150		86.5		47	as' 30.5	28		17.5		13		C–a' in prospect
mw	107		61		36	1/4	1/4		1/4		1/4		
Chimney Flute 8' ϕ	115×94		72×56	ds 63×49 e 61	43		27.5		18		15		
mw	1/4												
Chimney ϕ				e 13.7	11.6		8.2		7		6.5		
l				165	116		61		44		38		
Octave 4' ϕ	81		45		25.7		16		10.5		8.5		
mw	58.5		34		1/4		1/4		1/4		1/4		
Spitz Flute 4' ϕ	42/85		25.5/53		13.7/37		8.3/25		4.8/15.5		3.3/10.5		
mw	57		35.5		23		16		10.5		7.7		
Nazard 2 2/3' ϕ	52	B 34	40		26.5		17.8		11		7.8		C–B std
mw	1/4	1/4	26		18.2		12.8		8.2		5.9		
Super Octave 2' ϕ	?45		25.2		16.3		10		7.4		5.7		
mw	1/4												
Tierce 1 3/5' ϕ	50		30		19.5		13		8		5.5		
mw	30.5		19		12.8		8.7		5.6		4		
Mixture IV–V 1 1/3	1 1/3'	1'	1/2'	1/4'	1/8'	1/16'							Doubled ranks –2 HT
	30.6	24	15.5	9	6.5	4.8							
mw	1/4												
Trumpet 8' ϕ	92		73		60		52		47		45		

Table VII/27

Bryanston School	Echo (swell)	C–g'''	WP c. 50mm

	C		c		c'		c''		c'''		g'''		
Gedackt 8' ∅	110 × 76		63 × 45		38 × 28		25 × 20		18 × 16		15 × 13		As Wallsen mouth a little highe
Rohr Flute 4' ∅ mW	71 1/4		40.5 1/4		26.3 1/4		16.3 1/4		11 1/4	cs''' 6/12 7/4.5	5/9.7 1/4.5		As Wallsen
Chimney ∅ l	14.5 190		10 110		7.6 68		5.8 40		4.7 23				
Flute 2' ∅ mW	40/60 38		40.6 23.5		25 15.9		16.5 10.7		9.3 6.3		4.2/6.3 4.5		As Wallsen + 1HT
Larigot 1 1/3' ∅ mW	38 23.5		25.2 14.6		14.6 9.7		8.5 6.6		5.5 4.2		4.4 3.1		
Sifflute 1' ∅ mW	24 1/4		13.7		8.8		5.5		4	cs''' 4.6	4		cs'''–g''' repeats at 1 1/3'
Regal 16' ∅	43												('Trompeten regal') Laukhuff
Dulzian 8' ∅	40												Rogers

Note: For details of reeds see Appendix B 12

Bryanston School	Pedal	C - f'	WP c.76mm

	C		c		c'		f'						
Subbass 16' ϕ	200x 170		127x 105		77x 64		63x 52						As Wallsen +1HT
Flute 8' ϕ	155x 122		96x 73		65x 45		55x 37.5						As Wallsen +2HT
Octave 4' ϕ	88		48		28		22						
mw	61		36.3		22		18.2						
Mixture III 2' ϕ	44		25.2		16.3		13.7						
mw	1/4												
1 1/3' ϕ	42		26.3		15.2		12						
mw	28		18.2		11.6		9.5						
1' ϕ	30		18.6		12.6		10.5						
mw	1/4.5												
Posaune 16' ϕ	142		105		82		73						As 'normal' by Rogers
Trumpet 8' ϕ	120		92		72		66						

Mixture compositions

Mixture IV-V C	1 1/3	1	2/3	1/2			Pedal Mixture III			2	1 1/3	1
ds	2	1 1/3	1	2/3								
gs	2 2/3	2	1 1/3	1	2/3							
f'	2 2/3	2	1 1/3	1 1/3	1							
c''	4	2 2/3	2	1 1/3	1 1/3							
f''	4	2 2/3	2 2/3	2	1 1/3							
d'''	5 1/3	4	2 2/3	2 2/3	2							

Note: For details of reeds see Appendix B/2

Source: Scale sheets in G. Lhôte's hand

mixture. The suspended action proved exceedingly crisp and light, so much so that prior to the opening recital Lionel Rogg asked that the pallet springs be tensioned further to give a greater weight of touch (still only 140-80gm on the Great and 135-75gm on the Echo).

Also in 1980 Church completed a twelve-stop organ for St. Robert's Roman Catholic Church, Morpeth.[654] The internal layout and specification was basically the same as at Wallsend, other than the three-tower prospect, designed by the writer, and reflected in the soundboard layouts (Appendix E, 40).

In 1980 Walkers, under Pennells, completed the organ for University College School, London, an organ marking a strengthening of conviction in terms of classical organ building on the part of Walkers. The architecture of the organ, by David Graebe of Walkers, was a clear derivative of the Hamburg prospect with pedal towers flanking a central Great (Hauptwerk) Organ and Swell Organ (Oberwerk)(Figure VII/4 and Appendix D, 106-108). The specification (Appendix A, 88) is, however, bedevilled by compromise in an attempt to achieve versatility. The Great organ has principals at 8', 4', and Mixture pitches, and flutes at 8', 2', 1 1/3' and 1' pitches; the Nazard and Tierce however are placed in the Swell - an arrangement not unlike some moderate-sized Klais organs of the 1970's.[655] Where the organ differs from such instruments is in the 'reversal' of the reeds, the Trumpet 8' being in the Swell and the (strong) Cremona 8' on the Great.

Nicholas Kynaston, the consultant, has stated the basic requirement for the organ as "its ability to serve the repertoire" and as "an instrument that would provoke thought among the pupils destined to use it on the much neglected art of registration."[656] The outcome of meeting these somewhat nebulous requirements is an organ which attempts to be "all things to all men" - with certain consequences for the relationships within the stoplist. On the Swell the use of a Principal 2' de-characterises the Jeu de Tierce, and the Gemshorn 4' is inadequate as a real principal stiffening agent. The reversal of the reeds results in the Cremona being inadequate as a chorus reed, and too

Table VII/28

University College School	Great	C–c''''	WP 65mm

	C		c		c'		c''		c'''		c''''		
Open Diapason 8' ϕ mw	150 1/4		86		51		31		19		11.8		
Chimney Flute 8' ϕ mw	120 1/4		80		53		33		22		12.8		
Chimney ϕ l	1/4 1/4												
Principal 4' ϕ mw	84 1/4		48.5		29		18		11		6.7		
Flageolet 2' ϕ mw	51 1/4.5		31		18.4		10.5		6.25		3.7		
Larigot 1 1/3' ϕ mw	38.7 1/5		24		15		9.3		5.8		5.8		
Piccolo 1' ϕ mw	33.6		20.2		12.5		7.3		4		4		Harmonic except for the top 8ve
Mixture IV 2' ϕ mw	2' 42 1/4	1 1/3' 32 1/4.5	1' 26 1/4										
Cremona 8' ϕ	42		35		31.5		28		25	g''' 24			gs'''–c'''' flue pipes French shallots

Table VII/28

University College School	Swell	C – c''''	WP 70 mm

	C		c		c'		c''		c'''		c''''		
Stopped Diapason 8' ϕ	120 × 101		81 × 40.5		56 × 48		40 × 36		28 × 25		21 × 19		
Quintaten 8' ϕ mw	89 1/4		55		34		21		13.4		9.4		
Gemshorn 4' ϕ	81		49		30		18		10.6		6.6		1:2 taper
Flute 4' ϕ mw	84 1/5		55		36		23.5		15.4		10		Harmonic from f
Nazard 2⅔' ϕ mw	68 1/4.5		43.5		21.5		17.2		11		7		1:2 taper
Principal 2' ϕ mw	44 1/4		26		16		10		6		4		
Tierce 1⅗' ϕ mw	44 1/6		28		17		10.5		6.5		3.5		
Sharp Mixture III 1' ϕ mw	1' 24 1/4	2/3' 18.3 1/4.5	1/2' 15 1/4										
Cor Anglais 16' ϕ	104		80		68		52		40		40		1–24 1/2 L Hautbois resonator English shallots
Trumpet 8' ϕ	94		73		60		50		48		45		Top Notes Harmonic English open shallots

University College School	Pedal	C–g'	WP 75 mm

	C		c		c'		g'	
Bourdon 16' ϕ	285 × 254		157 × 132		103 × 86		78 × 66	
Principal 8' ϕ	158		94		57		42.5	
mw	1/4							
Gedackt 8' ϕ	98		62		39		30	
mw	1/4							
Wide Octave 4' ϕ	86 × 113		63 × 78		42 × 52		33 × 39	
Trombone 16' ϕ	140		105		126		76	1–12 1/2 l French shallots

Mixture Compositions

Mixture IV 2' C	2	1 1/3	1	2/3
gs	2 2/3	2	1 1/3	1
gs'	4	2 2/3	2	1 1/3
c''	8	4	2 2/3	2
Sharp Mixture III 1' C	1	2/3	1/2	
f	1 1/3	1	2/3	
e'	2	1 1/3	1	
ds''	2 2/3	2	1 1/3	
d'''	4	2 2/3	2	

Source: MS scale sheets of J. W. Walker

Figure VII/4

University College School
J. W. Walker, 1980

Source
J. W. Walker

"insistent" as a real Cremona; in turn the Great is deprived of a full-length chorus reed, surely a weakness in an organ which "has to be powerful enough for the accompaniment of about 700 people."[657] Although the Cremona can dialogue with the Swell 'Cornet', the disposition of the Trumpet 8' and Cor Anglais 16' under expression appears more to reflect a desire to have a 'full Swell', than to other considerations, despite the fact that the organ did not have to fulfill any liturgical function. Also, as Russill has noted, the provision of high pitched flutes on the Great is indicative of registrational habit influenced by open registrations.[658] Overall neither manual appears as fully integrated in its own right, or in relation to the total. Tonally the voicing by Michael Butler is, as Russill describes it, "robust and consistent but not harsh" and "the ensemble has warmth though some ears may find a touch of insistence in the Mixtures, Cremona 8' and perhaps the Quintadena 8'"[659]

The scales are given in Table VII/28, and the action layout (Appendix D, 106-108), was by Michael Tramnitz, who had worked for Klais, and who was employed on a free-lance basis by Walkers. The action is straightforward and centre pivoted, the touch clean and unfussy, though with limited control of speech initiation, and the wind supply is via inbuilt regulators. The chest arrangement is logical, with both Great, and Swell (above), behind the 8' prospect, but the pipe layout as shown in the drawings, especially on the Swell and inner flats, does not bear a totally convincing relationship with the prospect: the tensions between a Hamburg prospect and Great and Swell divisions from which the maximum colour is to be extracted, at the expense of the individual choruses and their relationships, remain fundamentally unresolved. The organ was neither north German fish nor, despite Walker's and Kynaston's claims of 'Englishness',[660] English fowl though, in Russill's words, as "part of a trend of increasinly wholehearted and discriminating involvement by one of our large firms in the return to classical disciplines, it is encouraging."[661]

Another organ completed in the same year, and laying claim to 'Englishness', was that in Pembroke College Chapel, Cambridge. Here Mander built a new organ utilising the Smith/Quarles Great and Chair cases, and a number of pipes by Smith, notably the prospect pipes and Stopped

Diapasons.[662] This was the third attempt in four years to build an organ utilising Smith casework, and the second attempt to build an organ based around Smith pipework. Initially a small team comprising the writer, Nicholas Thistlethwaite and Nicholas Plumley, on behalf of the British Institute of Organ Studies, reported to the College on the Smith/Quarles material, and recommended a restoration along the lines of the original organ which had a typical seventeenth-century English specification:[663]

Pembroke College Cambridge: Smith/Quarles, 1708[664]

Great		Chaire	
Open Diapason	8	Stopt Diapason	8
Stopped Diapason	8	Principal	4
Principal	4	Nason (Stopt Flute)	4
Twelfth	2 2/3	Fifteenth	2
Fifteenth	2		
Sesquialtera III			
Cornet IV			
Trumpet	8		

In the event Cecil Clutton was appointed consultant and proposed two schemes, one described as a "Compromise Organ"[665] with a Swell division comprising Viola, Celeste, Harmonic Flute, Twenty-second, Trumpet and Vox Humana (!). The final tonal scheme adopted by the College was superficially related to the 1708 specification:

Pembroke College, Cambridge: Smith/Quarles/Mander, 1980

Great

Open Diapason	8
Stopt Diapason	8
Principal	4
Twelfth	2 2/3
Block Flute	2
Tierce	1 3/5
Cornet V	
Fourniture IV	
Trumpet	8

Chaire

Stopt Diapason	8
Principal	4
Nason Flute	4
Fifteenth	2
Cymbal III	
Vox Humana	8

Pedal

Bourdon	16
Principal	8
Fifteenth	4
Mixture IV	
Shawm	16
Trumpet	8

As in the case of the University College School organ by Walker, compromise was evident. The organ was intended by Clutton to be "capable of rendering almost the entire classical repertoire."[666] John Mander, who was responsible for the work, on the other hand wished to adopt a more radical line of restoration, including the return to long-compass manuals and without a pedal division, but he was over-ruled by Clutton and the College.[667] Whilst on paper Clutton's specification resembled the original, the connection is slight beyond the employment of the original Open and Stopped Diapasons. The remainder of the organ was based heavily on the organ in Adlington Hall.[668] Whilst this organ has in it material by Smith, its origins as a unity remain open to question and its relationship with Pembroke more than tenuous. Clutton, however, had persistently proposed the notion of Adlington as representative of seventeenth-century English organ building,[669] and John Mander, who as a child had assisted in taking the Adlington organ down for restoration in 1959, clearly had a sentimental affection for it.[670] The result was that Clutton and John Mander were prepared to rely almost exclusively upon the Adlington organ in building the Pembroke organ; scales, mouth treatment, soundboards, rollerboards were all based on Adlington.[671] Quite apart from the merits of the Adlington organ per se, its relationship with seventeenth-century English organ-building, its internal diversity, as also its ambivalent relationship with Smith,[672] provide little justification for its use as a model at Pembroke.

The resulting organ, not surprisingly betrays a similar disunity to Adlington, lacking, as Russill has pointed out, the fundamental chorus relationships of the seventeenth-century English organ.[673] The over-emphasis on wide scale flutes above 4' pitch, is not compensated for by the over-powerful, low-pitched, Great Mixture designed by Clutton. Equally the voicing betrays the same elements of fullness and loudness, seen to greater or lesser degree in all John Mander's work since his return from von Beckerath. Whilst he made every attempt to build a musical instrument, as shown in the sensitive restoration of the old cases, sensible placement of the Pedal and well crafted soundboards, action and winding, and in the use of unequal temperament, nevertheless the organ lacks a totally convincing musical unity, either within itself or in relation to the Chapel. The case was pointedly put, if from a position of bias, by Nicholas Kynaston at the opening recital, "If this is the historic English organ it is hardly surprising that there was no further development."[674] It may thus be suggested that the importance of the organ lies not in its intrinsic merit, but in its demonstrating the growing search for a national style aesthetic.

At Christ the King Roman Catholic Church, Reading, the experience gained by John Budgen of Bishops at Grays led to Bishop being commissioned to build a small two-manual organ completed in 1980. Sited in a transept gallery it had a Great and Chair disposition with principals at 4' and 2' respectively. The case (Appendix D, 110), designed by the writer, was based on the 1975 organ by Blank of Herwijnen, in the Reformed Church in Twello, Holland[675] (the initial sketch, by Budgen (Appendix D, 109) indicated a limited understanding of organ design on the part of Bishop). A variety of influences, apart from the case, are evident in the organ, in particular the use of Schnitger scales at Grays, and also Budgen's experience in maintaining the Flentrop organ in the Little Oratory of Brompton Oratory. The scales (Table VII/29) of the Chair organ were taken from the Bovenwerk of the Flentrop organ, as was the Downes/Flentrop Sesquialtera composition, and the Fifteenth

Christ the King RC Reading	Great	C–g'''	

	C		c		c'		c''		c'''				
Stopped Diapason 8' ϕ	108x 98		65x 48		45x 25		25x 19		npta				
Principal 4' ϕ	79		44		27		16		8				Prospect Sp. m.
mw	1/4												
cu	c. 1/4												
Spitzoctave 2' ϕ	43		29		16		8						3:4 tape
mw	1/4·5												
cu	c. 1/4												
Mixture III 1' ϕ	25												
mw	1/4												
cu	c. 1/4												
			Chair										
Gedact 8' ϕ	90x 70		60		43		32		22				
cu	c. 1/4												
Flute 4' ϕ	62		46		33		22		14				
mw	1/4·5												
cu	c. 1/4												
Principal 2' ϕ	44		25		14		10		6				Prospect Sp. m.
mw	1/4												
cu	c. 1/4												
Sesquialtera II 2 2/3' ϕ	27												
mw	1/4·5												
cu	c. 1/4												
			Pedal										
Bourdon 16' ϕ	npta												

Mixture Composition

Mixture III	C	1	2/3	1/2
	c'	1 1/3	1	2/3
	c''	2	1 1/3	1
	c'''	4	2 2/3	2

Source: Scale sheets by John Budgen

and Mixture were from Schnitger. The touch, however, resembled nothing more than Sutton's description of Smith's actions, "very disagreeable to those unaccustomed to play on them, feeling as though cotton wool was placed under each key."[676] To some extent this was due to Budgen's insistence upon the 'second' manual being the upper manual, and in part to a lack of sophistication in design as shown in the drawings (Appendix D, 111, 112), and construction.

In St. Robert's Roman Catholic Church, Fenham, Newcastle, in 1980, Harrison re-entered the classical field after an absence of some five years. Cuthbert Harrison, whilst maintaining a daily interest in the firm, had handed over the management to Mark Venning, an organist, trained at the Royal College of Music, who had taught at Sherborne School. In organ building his training appears to have been that of working alongside Cuthbert Harrison for several years prior to 1980. The Fenham organ demonstrates, as does the University College School organ, the problems caused by the Swell organ in England. Fenham goes further and shows the obsession with 'the console'. As the sectional drawing (Appendix D, 113), shows, these two items dominate this modest organ of only thirteen stops (Appendix A, 89), and force the action to have excessive horizontal travel, resulting in a markedly insensitive key touch. The sound was very much in the Harrison neo-classical tradition, established by Downes, forceful and, for the player seated at the console in line with the Swell, very unpleasant. The case architecture was 'poor man's Dallam', a vestigial echo of the glory of that in King's College, Cambridge (Appendix E, 41). Whilst the organ was a positive step in the direction of classicism, comparison even with the University College School organ shows just how far Harrison's development lagged behind that of their competitors.

A trickle of imports arrived in the last year of the decade, a one-manual organ by Freiburger Orgelbau for St. Anne's Roman Catholic Church, Caversham, Reading; a box organ for the Carmelite Monastery at Ware by Schumacher; a one-manual by Tamburini for St. Hugh's College, Oxford; and a two-manual organ by Frobenius, for Robinson College, Cambridge. The Schumacher organ was a standard model, the scales derived from Silbermann.[677] The Caversham and St. Hugh's organs both demonstrated conscious historic awareness on the part of builders.

Though quite straightforward one-manual and pedal organs they were noteworthy in that the Caversham organ case (Appendix D, 114), was based on the c1450 organ at Kiedrich, the St. Hugh's organ on the Rückpositiv organs of the 1555-61 Ebert organ, in the Hofburg Chapel, Innsbruck, and the nave organ (of 1520) of Freiburg Cathedral (though with pipe shades derived from the 1470 di Prato organ in St. Petronio, Bologna).[678]

St. Anne's RC Church Caversham, Reading Freiburger Orgelbau, 1980		St. Hugh's College, Oxford, Tamburini, 1980	
Manual		Manual	
Principal	8 (from c)	Bordone	8
Bourdon	8	Ottava	4
Salicional	8 (from c)	Flauto	4
Octave	4	XV	2
Rohrflöte	4	XIX	1 1/3
Mixtur III		XXII	1
Super Octave	2 (from Mixtur)	Cornamusa	8 (Treble)
Sesquialter II			
Nazard	2 2/3 (from Sesquialter)		
Pedal		Pedal	
Subbass	16	Subbasso	16

It has been repeatedly noted how the excellence of the Frobenius organs in the Danish Seamen's Chapel and, in particular, the Queen's College, Oxford, has been the yardstick by which other, later classical organs in England have been measured. The progress of the classical revival can almost be gauged by the combination of 'rivalry' and interchange of ideas between persons and institutions in the two Universities. Frobenius' contribution to organ building in Cambridge was the provision of an organ, in 1980, for the new chapel of Robinson College. Here, as with the first Frobenius organ in the Danish Seamen's Chapel, was accomplished a harmony between organ and architecture in both visual and tonal terms - in few new churches has such harmony been achieved in the period under review.

Unlike the Queen's College and Stoke d'Abernon organs, the contemporary chapel of Robinson College gave Frobenius the opportunity to build an organ in England in contemporary 'Scandinavian' style. The chapel is unusual in being a long thin rectangle with the central axis on the short axis, and the organ is placed in a stepped side gallery, thus directing the sound along the long axis. The brick chapel had a clear and resonant acoustic. Both disposition and prospect of the organ derived from the stepped gallery and sloping roof (Figure VII/5). The Pedal division stands at the back of the organ against the side wall of the Chapel, the Great forward of the Pedal, and to one side, and the Rückpositiv (which has perspex shutters and doubles as a Swell organ), is free-standing forward of, and to the side of the console. The sloping roof line of the Chapel, from 'east to west', was a natural encouragement to Frobenius to employ a stepped prospect in augmented fourths, typical of so many Frobenius organs, commencing with Kalvehave. The case, of Oregon pine, derives its details from the general woodwork detail of the chapel and its furnishings, and it would seem that the architects of the chapel, Gillespie, Kidd and Coia, together with the adviser Gerald Gifford, played some part in the harmonisation of the case design with the architecture and furnishings of the chapel.

Robinson College, Cambridge, Frobenius: 1980

Great		Swell Positive	
Principal	8	Gedakt	8
Fløjte	8	Gamba	8
Oktav	4	Principal	4
Fløjte	4	Fløjte	4
Quint	2 2/3	Nazard	2 2/3
Oktav	2	Oktav	2
Blokfløjte	2	Larigot	1 1/3
Terts	1 3/5	Scharf III	1
Mixtur IV	1 1/3	Krumhorn	8
Trompet	8	Tremulant	
Tremulant			

Pedal	
Subbas	16
Oktav	8
Gedakt	8
Superoktav	4
Mixtur III	2
Fagot	16
Skalmej	4

Figure VII/5

Robinson College, Cambridge
Frobenius, 1980

The stoplist is a straightforward one, a larger 'version' of Queen's in which 'liturgical' usage has played its part. This is clearly shown by the provision of a mild Salicional in the Rückpositiv, and by the use of the Swell shutters, albeit transparent ones, in that division. The Rückpositiv does not appear to lose its immediacy and clarity by this enclosure and it is perhaps interesting to note that Frobenius, thought of as a thorough-going classical organ builder, should produce very satisfying solutions to the problem of the Swell organ (though this is less sprprising when one recalls the extent to which Frobenius has consistently employed enclosed divisions, and continues to do so).[679] It has not been possible to ascertain the scales of this organ, but the impression given by the sound, and by inspection of the pipework, suggests that the scaling is in general a little wider than at Queen's.

As is already clear, the organ is no historic copy and throughout employs contemporary materials; ply and other laminates are to be found alongside traditional timber and metal. The wind supply is similarly modern, taking up little space and using spring-loaded in-built regulators. The action is compensated with floating square-beams, plastic laminate is employed for the 'squares', which are in fact triangular. Tonally the organ is typical of Frobenius - a style achieved largely by good placement, tonal casework and a house-tradition of scaling and voicing built up over a long period of time giving bright principals and trumpet, mellow and clear flutes, Krumhorn, and Fagot of character and richness. The concern for 'flexibility' in liturgical use has overflowed into the provision of a large number of thumb and toe pistons, and these and their associated electrical mechanisms are the only serious intrusion into the harmony of the organ.[680]

As shown in this part the overall pattern of the emergence of classical organ building in Britain is clear, however untidy. In one sense it is true as Williams suggested, that English organ building has had to (and continues to) pass through the "various stages of the Orgelbewegung,"[681] a process so succinctly and wittily analysed by Glatter-Götz.[682] But it may equally convincingly be suggested that English organ building has more closely followed the path of the American organ revival. Unlike Germany, where the presence of many relatively well preserved old organs was influential, the initial influence of the native historic classical organ in England was negligible, despite Dolmetsch, Jeans and Dart. Historic organs became influential first through the recordings of north-German organs by Walcha and Richter, by radio programmes, such as those of Clutton and Geraint Jones, and then by visits to organs in northern Europe by English organists.

In terms of the organ builders, it has to be said that no major artistic figure such as Zachariassen, Flentrop or von Beckerath emerged in Britain to give a lead. The establishment builders, content to rest on the laurels of their romantic past and, propped up by establishment organists cocooned in their own ecclesiastical organ world, took no initiative, unless under pressure from non-establishment figures such as Weitz, Jeans and Downes.

Downes, who in popular terms[683] has been seen as the father of organ reform in England, returned to England from America, bringing with him experience of the American version of the _Orgelbewegung_, notably in the work of Holtkamp and in the American 'classic' organ of Donald Harrison and Aeolian-Skinner. The result of these American experiences, and of later experiences in France and Holland emerged in the building, under Downes, of the electropneumatic Festival Hall organ, an event seen by many as showing that organ reform had taken root in England.[684] Yet these roots, as Williams wrote, were in many ways "thin, weedy and unprogenitive."[685]

Awareness of the value of mechanical action, and of Danish organ building, on the part of Francis Jackson had some further effect, as did growing awareness of the significance of the organ case on the part of Grant, Degens and Bradbeer, factors leading to the emergence of a number of compromise neo-classical organs. The late 1950's and 1960's saw a more radical change, a change distantly foreshawed at by the installation of Susi Jeans' organ in 1935. First was the arrival of a number of small imported organs by Marcussen and Frobenius, while at the same time the younger generation of organists such as Dalton, Lumsden and Hurford encountered historic European organs and the new

Danish, and other Zachariassen - inspired mechanical-action organs, both in Europe and North America. With the building of the Frobenius organ in the Queen's College and the Flentrop organ in the Queen Elizabeth Hall, the "classical" organ was established in Britain, and within the next few years classical organs by native builders had been installed in Shellingford and New College; this latter especially was a challenge to builders and players alike to re-examine their thinking.

The pattern described above was identical with that which had occurred in North America. In the United States the importation of a number of small organs with mechanical action and encasement by Rieger and Flentrop was followed by the installation of one or two large and significant imported organs (von Beckerath, Trinity Church; and Flentrop, Bush-Reisinger Museum). These in turn were responded to by native builders such as Schlicker and Fisk (Mount Calvary).[686] Further north in Canada a few years later the pattern was again repeated, the von Beckerath organ in St. Joseph's, Montreal, provoking the building, within the Casavant firm (with Phelps, Wilhelm and Wolff) of the organs for St. Jean, St. Joliette, St. Pascal and Our Lady of Sorrows, Toronto.

The work of the emergent classical builders such as Collins and Forsyth-Grant was, at first, regarded patronisingly by the establishment builders. As Glatter-Götz wrote, the 'big' builders "smiled mildly over the efforts of small builders who tried to improve their mechanical actions, slider chests and cases with blood, sweat and tears, and to find customers and approval."[687] As time went on, however, "more and more churches ordered mechanical-action organs from small builders and the large firms were not even invited to tender for prominent projects,"[688] a matter shown very clearly in the Clare College Organ File.[689] The efforts made to change by the larger firms in the period under review met with limited success. The hand of the past lay too heavily on firms such as Harrisons, Rushworths and Mander,[690] though in the two latter cases the younger generation had been sent abroad for their education. Harrisons' initial move towards mechanical action at the Royal College of Music led them little further. An exception to this might be seen to some extent in the case of Walkers: here the impetus came from the take-over by Pennells, who also sent his son abroad for training in Germany. From their re-establishment at Brandon, Walkers may, however, be regarded as a 'new' firm, their past counting little more than the name. Now, as Glatter-Götz wrote, the "small builders smiled mildly."[691]

By 1972 a clear pattern of imported classical organs (around 20% of the total built in 1955-73)[692] alongside new instruments from young firms committed to the classical style, and tentative approaches to this style in a lacklustre manner from the older firms, was established in England - a pattern which was to persist into the 1980's. The process of growth and development in England is charted in microcosm in the history of the building of the first organ by an English builder committed to reform, that at Shellingford. First there was Andrew Williams' experience of central European organ building, an experience leading to the conviction that "classical 'werk' principal [sic] is the only true basis of organ construction."[693] This was followed by a realisation of the unsatisfactory state of English organ building. Secondly there was the influence on Williams of the first major imported classical organ, that at Queen's, followed by his search, first amongst the establishment builders (whose complacency is all too clearly shown in the Shellingford organ file), and then outside them, for an organ builder of musical vision. Thirdly is seen the wish to have a native craftsman builder, and the later disillusion with the results of the inevitable inexperience of such a builder, followed by the wish to have a better organ and hence to further importations. This was a pattern repeated several times in the period. The method of construction at Shellingford was also that of much organ building in ensuing years. The buying in of actions and pipes from trade suppliers such as Laukhuff, Giesecke, Heuss, Stinkens and Rogers, all of whom had relatively long-term specialist experience, is all to be seen at Shellingford. Whilst this form of building gave a certain amount of security to clients, at the same time it may be suggested that it gave inexperienced builders a false sense of security and militated against the individual development of artist craftsmen.

As yet there has not been seen in England native artistic work comparable, for example, to that of the early work of Marcussen at Jaegersborg, Flentrop at Doetinchen, or Metzler at Schaffhausen; or later organs such as those by Marcussen at Linz, Flentrop at Duke

University, and Metzler at Frauenfeld. Whilst it is easy to point to the Queen's College and Robinson College organs (which, in a sense open and close the central section of this study), as exemplifying the continuing excellence and dominance of European builders, it must also be recalled that the European builders have had the benefit of far longer experience, essentially from the 1930's and 40's into the 1980's, coupled with easy access to both contemporary and historic organs. English organ building has had barely fifteen years of re-development, as well as having to contend with the existence of few, if any, significant extant historical organs. To this must be coupled the physical fact of the English Channel, giving rise to insular attitudes which have not always been helpful to the development of the organ in the 1960's and 70's. Further, English organ builders have not been aided in their development, as have builders in Scandinavia, Holland and Germany, by a 'church tax'. On the contrary, a factor which should not be ignored is that the period of the development of classical organ building in Britain has coincided with a period of severe economic decline and the imposition of Value Added Tax in England. The organ is no mean barometer of economy and culture and inevitably many English organs of the period reflect the general economic impoverishment. Also there have been significant losses in English organ building in the 1960's and 70's: the rejection by J. W. Walker of Peter Walker, just at the time when his Zachariassen-inspired philosophy could have done so much to enliven the fading fortunes of the firm, the gradual decline of Grant, Degens and Bradbeer after the building of the New College organ (due to Forsyth-Grant's disillusion with English organists and builders), and the inability of ten Bruggencate to establish a firm financial structure for his work.

Detailed aspects of design and construction will be considered below but a few general stylistic trends can be summarized. Initially the classical organ was seen in terms of the historic north European organ. During the period there has been a growing awareness of other cultural styles, Italian, French and Spanish and, more latterly, the historic English organ. So far it might be suggested that the most convincing demonstration of organ building with a relationship to the English past has been the Smith/Metzler organ in Trinity College. As yet, however, England has not seen the building of a 'style copy' organ more plausible than Quarles/Smith/Mander organ in Pembroke College.

In tonal terms the adoption of the tenets of organ reform, and reaction against the romantic organ, led first to a minimising of the number of 8' stops and to the adoption of open-foot, nick-free voicing. Inevitably at a time of reaction some voicing had excessive speech transients and a thin scratchy tone. As Kinsela commented regarding the early post-War work of Metzler, the chorus work of such organs did "not pass the test of developing in majesty but without an increase in harshness."[694] The early organs of Grant, Degens and Bradbeer, Collins and Church show this trend very clearly. A reaction to this trend can be seen in the work of Collins at Paddington Green, and on the part of Church, following his association with Lhôte. Though many of the organs discussed have a certain vitality, equally there is often present a brashness and insensitivity (aurally and visually), that is far removed from the 'beautiful tone' of the old organs so beloved by Schweitzer. These qualities of beauty, evident in the organs of Eton, Trinity and Queen's, contrast vividly with the overbearing excesses of Shellingford and Hucknall. It should also be recalled that it was not just English organs which suffered from these negative qualities: some of the imported organs also showed similar characteristics.

The challenge to the players, as shown by the comments of Cambridge organ scholars after Rogg's master class at Clare, was very clear. As Glyn Jenkins said: "we were up against a particular problem with Rogg at Clare, however, in that most of us had not up till then played a modern instrument with so responsive a mechanical action."[695] It was not, of course, just the challenge to the fingers: the challenge to the understanding of organists was perhaps greater. As David Lumsden wrote regarding the early days of the New College organ:

> "I recall the whole operation as one of continued revelation and excitement, followed by disappointment at the uncomprehending narrow-mindedness of many who came to play and hear the instrument, tempered by delight when a kindred spirit discussed unexpected new delights in the instrument. Perhaps it is not unworthy of note that non-organist musicians tended to like it more than the organists - what does that tell us......?! [696]

PART FOUR

Chapter VIII

Aspects of Technical Design

Very little technical information has been available in relation to recent classical organs, since writers such as Clutton and Niland have contented themselves with generalisation. A few articles have been published, e.g., Peter Walker,[1] Peter Collins,[2] and Herbert Norman,[3] and some additional information is also to be found in the 1980 edition of The Organ Today. None of this information, however, relates to any specific organ and the position up to the present has been that commented on by Williams in the New Grove Dictionary:

> "It is difficult to be certain of basic facts. Fewer scaling figures of the organs of Cavaillé-Coll, for example, have been published than those by Clicquot or Silbermann, while virtually no such details of English organs are known outside a few builders' workshops." 4

In the period of the classical revival in Britain, from World War II to 1980, no details of scales were published for any mechanical action organ, nor, until the building of the Rieger organ in Christ Church, in 1979, were any details of action layout.[5] The only scales published prior to 1980 were those given by Downes for the Festival Hall and Brompton Oratory electropneumatic organs (see Chapter V). Whilst this study is not a "guide book for the craftsman,"[6] nevertheless it does give such "basic facts" as would enable a fair reconstruction of a substantial number of organs of the period, though the information is inevitably less than totally comprehensive. Each area such as scaling, action or architecture merits a major study in its own right. Also the reluctance of some builders and consultants to allow certain details to be given,[7] coupled with difficulties of access for examination and measurement, due to the ownership or use of particular organs, has been inhibiting on occasion. Nevertheless, the technical details given below, derived from workshop practice, observation of builders' work and study of their shop books, drawings and files, as also discussions with many organ builders concerned, is greater than that in any comparable study. As well as the scalings of a significant proportion of the instruments in the period, the presentation of over one hundred original shop drawings (Appendix D), together with photographs (Appendix, E), helps to clarify much building practice.

Position

As Oberlinger has pointed out "the proper location for an organ is the first decisive choice... before the planning of the instrument itself can begin."[8] What Principal lengths are possible in prospect, how many divisions, and what arrangement for them, all these depend upon the siting of the organ. Whether in church, hall or room, the location of an organ is determined by three main considerations - function, acoustic and mechanics, as also by the need to integrate with its architectural surroundings.

Throughout history no definitive norms for placement have been arrived at in any religious tradition. Leaving aside small positives, organs have had a variety of locations: on the north side above the choir stalls;[9] above both choir stalls;[10] in a 'swallow's nest' on the nave wall;[11] in galleries at the west end,[12] and east end;[13] in transept galleries;[14] and on the pulpitum, or screen.[15] It is noteworthy that all these positions are elevated ones. On the whole such locations have been arrived at first in response to liturgical demand, a demand which in general was met by a relatively small organ. Larger organs in transept and west galleries are usually expressions of pride and dignity, as at Rheims and Weingarten.

The only clear directive regarding placement today appears to be that for the Roman Catholic Church, where the General Instruction on the Roman Missal states that the organ should be placed where "it can support both choral and congregational singing and also be heard properly when played alone."[16] In the Church of England the Tractarian tradition, so heavily influential in the nineteenth century, remains a pressure for the organ to be placed in the chancel area, though liturgical change is opening up wider possibilities. Liturgical requirements can, as Oberlinger points out,[17] present certain dilemmas;

especially where a return is made to the centrality of altar, lectern and font, in a space around which all gather for worship, the same space being often used also as a concert platform, albeit for mostly sacred concerts. The concentration of ministers, musicians and the organ in such an area can present problems which are not easily resolved, and is often complicated further by the dual role of the choir, which can be seen both as a separate entity, and as a part of the congregation. Placing an organ, especially a relatively large organ, to function well and meet these various demands is not always simple, and conflict between the best liturgical position and the best acoustic position for the organ is evident throughout the period.

For the organ to function well its relationship with the acoustic is of prime concern. As Glatter-Götz commented, "Many organs are famous because of the room and acoustic in which they stand"[18] (a statement confirmed by Churcher[19] and Lottermoser[20]). Acoustically there are a number of simple general principles for location:

i) The organ should be placed in the same acoustic space as the people it serves, "The greatest humiliation for the organ is when it is placed in another room."[21] There can, of course, be tensions here if congregation and choir occupy effectively separate acoustic areas.

ii) The organ must sing freely and easily into the main body of the building; if it does not, its tone will be either forced or recessive.[22] A position for the main organ on the principal axis of a building (usually in a gallery) has thus always been highly regarded, whether in Roman Catholic or reformed churches.

iii) A good internal functioning of the organ must not be compromised by its location. Mechanically the organ should be placed so

> that it has "a simple action route, as direct as possible,"[23] and it should also be free on all sides, not just for access, but so that the vibrating case and pipes are in contact with the main volume of air in the building.[24] Additionally the reflectivity from a wall a foot or so behind the organ can also be advantageous.[25]

Remarkably little has been written by organ builders about the matter of acoustic and location, even though, as Glatter-Götz suggested, "The acoustic counts for 50% of the success of an organ and placement for 25% of its success,"[26] leaving only 25% in the control of the organ builder. Organ builders such as Smith,[27] Silbermann,[28] and Metzler[29] have, however, shown their conviction in this respect in declining to build organs in inadequately reverberant buildings.

Small positives excepted, recent classical organs in Britain show a variety of locations. The main axis, west gallery position is seen, for example at The Queen's College,[30] Clare College,[31] Wallsend,[32] Henley[33] and Pembroke College.[34] A similar position, though in secular surroundings, is also found in the Reid Hall, Edinburgh[35] and School Hall, Eton.[36] An unusual, off-centre, west gallery position was used at Haverfordwest[37] so that more sound could be directed into an extension built at right angles to the chancel. Another main axis position, a particularly English one, on the pulpitum, has been retained in collegiate chapels such as New College,[38] Trinity College,[39] and Christ Church Cathedral.[40] In a collegiate chapel the matter of main sound direction is clear - into the choir. At Hexham,[41] however, a conscious decision was taken to relate the organ sound to the nave and not to the choir, with consequent musical and architectural loss. Transept galleries have been employed at St. Mary's, Nottingham[42] and Northampton Roman Catholic Cathedral,[43] and side galleries, usually near the chancel, have been used as in the Danish[44] and Finnish Seamen's chapels,[45] in St. James', Scarborough,[46] and Christ the King Roman Catholic Church, Reading.[47] Interestingly enough, the very Protestant ('Margrave') location[48] (i.e., on an east gallery above the altar), is used in the Roman Catholic 'Little Oratory' in London.[49]

There is a growing tendency to place new organs free-standing on the floors of churches, a tendency beginning with the west-end location at Shellingford[50] as also seen at Cranford,[51] Clifton, Nottingham,[52] and Stoke d'Abernon.[53] A more unusual approach to organ location in the established church has been to place the organ behind the main altar, facing west, as at Worksop,[54] Woodford,[55] and Bryanston[56]; the comparable position in nonconformist churches, as at Dorchester,[57] has, of course, been quite standard practice. Positions on the floor to the side of the nave have been used. At Mold[58] the coherence of choir and organ, as a unit to lead the congregation, led to the organ being placed within the nave arcade behind the stalls.[59] Similarly in Roman Catholic Churches such as Blackheath,[60] Finchley,[61] Digby Stuart College,[62] and Keighley,[63] locations have been adopted that enable the organ to accompany a cantor or choir leading the singing from the lectern, or sanctuary area, and also to lead the congregation. A few organs, notably Horsell,[64] Winlaton,[65] and Drax,[66] have been placed facing west at the eastern end of side aisles, a less than convincing solution architecturally or acoustically. In newer churches such as Clifton Cathedral,[67] Thatcham,[68] Woodley,[69] Marlow,[70] and Dorridge,[71] the relationship between organ and altar has clearly been the dominant factor in determining the position of the organ. Gallery installations are rare in such new churches due both to financial constraint, and to the low ceilings (generally around four metres), over the greater part of such buildings. A position to the side does pose a number of problems and generally precludes a large organ. Shallow case depth is vital if the organ is not to intrude upon the architecture, as is the case to some extent at Douai Abbey[72] and Blackheath.[73] As yet no organ has been built in England in a 'swallow's nest', though this location was contemplated at Blackheath.[74] The two volumes of The Classical Organ in Britain, and instruments built since then, show a number of trends in terms of location for organs, (other than positives):

i) movement towards a west end placement; around half the organs are in this position

ii) use of an elevated position; some two-thirds of the organs are in elevated positions

iii) a location on the floor at the west end is strongly favoured in the established church, whereas virtually no organs are found in this position in Roman Catholic churches

iv) There are more organs in west galleries in Roman Catholic churches than in Anglican churches, approximately three to two, but this proportion increases markedly in favour of Catholic churches if collegiate establishments (such as The Queen's College) are ignored.

Whilst the adoption of a gallery position has, as Sumner[75] suggested, clear acoustic advantages, it might also be commented that there is pressure, especially amongst Roman Catholic clergy, to place the organ in a gallery so that it cannot be tampered with.

Clearly there are occasions where more than one solution is possible and where one aspect of function has dominated. At Northampton Roman Catholic Cathedral the transept gallery location was decided upon because:

i) it was close to the central altar and would thus emphasize a feeling of community around the altar

ii) the Cathedral is small and there could be no loss of floor space

iii) financially only a small organ was possible

iv) it spoke directly into the largest acoustic volume, the transept area

v) although there was a west gallery, placing the organ in it would have blocked out a considerable area of stained glass

vi) it was tamper-proof

Other side locations in more constricted acoustic surroundings than Northampton, have proved less than satisfactory, e.g., at Blackheath the Pedal organ is effectively in the side aisle.

Two of the most problematic locations encountered are those of Worksop Priory[76] and St. Mary's, Nottingham.[77] Whereas the east-end position at Bryanston and Woodford, where the nave is short, is admirable, at Worksop the presence of a central tower and a very long nave posed considerable problems which were not resolved by a main-axis, east-end position. The tension is even greater at Nottingham where the organ perches uneasily, facing west from the east corner of the south transept. The aim was clearly to direct the sound into the main body of the nave, whilst also allowing the organ, with its relatively generous Swell division, to accompany the largely nineteenth-century Anglican choral repertoire, being sung, 'round the corner', in the choir stalls. Neither musical demand is entirely satisfied, nor is the relationship between the organ and the total architecture of the church convincing - a point made by Downes.[78]

It must be said that English medieval (or quasi-medieval) churches, where the singers remain in the choir stalls, present a considerable problem. Often nave and choir are, acoustically, separate areas needing two organs. The nineteenth- and twentieth-century Anglican choral repertoire, e.g., Stanford, Howells, Tippett, requires a relatively large organ, for which, as at Nottingham, there is no room near the stalls, and yet if there were, then it would be too remote from the nave. At Douai Abbey, where nave and choir are acoustically separate areas, the problem was simply solved by the use of two organs; a small one in the choir, and the retention of the large Rushworth organ in the nave. Here a small organ was more than adequate for the musical needs of the monastic Mass and Office sung in choir.

The location of concert hall organs is in general a straightforward matter of relationship to the concert platform, as in the Lyons Concert Hall, York University,[79] Royal Northern College of Music,[80] Turner Sims Concert Hall, Southampton University[81] and, although in a converted church, Huddersfield Polytechnic.[82]

One acoustic matter which cannot be ignored in many contemporary churches, e.g., Woodley,[83] and Clifton Cathedral[84] is that of low ceilings over the main seating area. As Klotz indicates, organ sound travels "not only horizontally forward, but sideways and upward as well."[85] Such low ceilings do not allow organ sound to expand and radiate easily. At Clifton Cathedral the acoustic separation of organ and high ceilinged sanctuary area from the low ceilinged nave is very evident, and the conflict between the architectural expression of communal 'cosyness' and acoustic segregation has not been adequately resolved.

Disposition

The general trends related to disposition are shown in Volume 2 of The Classical Organ in Britain,[86] trends that did not alter in 1979 and 1980.[87] Around 55% of organs installed have one manual, some 40%, two manuals, three- and four-manual organs accounting for only 5%. The preponderance of small organs reflects a variety of factors - small budgets, liturgical needs, and continuo use, e.g., instruments suitable for increasingly 'authentic' performing practice. The disposition of two-manual organs (one hundred such were built between 1955 and 1980) shows that once the number of stops exceeds around a dozen, a Werkprinzip arrangement is adopted. Below this number the stops of both manuals tend to be placed on one chest level with either a double row of pallets, as at Wallsend (Appendix D, 86), or twin-chests, as at Finchley (Appendix D, 78). Such an arrangement has the advantage that the player, who is close to the divisions, hears both manuals in good balance. The majority of small, single-chest, two-manual organs, e.g., Chalfont[88] and Wheatley,[89] are however house, or practice, organs.

The most basic form of Werkprinzip found is exemplified by the Collins organ at Manchester University, which employs two separate box organs stacked vertically, together with a 'free-standing' pedal organ.[90] Perhaps the most clearly defined classical disposition for a two-manual organ is that of Hauptwerk and Rückpositiv, where each division is clearly delineated spatially in its own case, e.g., Henley, Reid Hall, Coxwold and Christ the King, Reading. No less than eleven such organs have been built since 1973, though some, e.g., Eton and Trinity Colleges, have old cases. Within this form a number of variants are to be seen. At Sandiacre[91] the Hauptwerk is a Swell Organ, and at Robinson College the Rückpositiv is under expression. The restricted gallery ceiling height at Sydenham[92] caused reversal of manual relationships, the Rückpositiv being the main manual (with a 4' principal), the second manual (with a 2' principal) a '<u>Brustwerk</u>', with shutters, above the console. While most organs with a <u>Hauptwerk/ Rückpositiv</u> disposition are placed in the traditional gallery position, the Mander organ at Hampstead[93] is placed on the floor with the <u>Rückpositiv</u> behind the player's stool.

A considerable proportion, around one-third, of organs with two manuals fall into some form of <u>Hauptwerk/Brustwerk</u> arrangement. The forms adopted are:

i) a strict Werkprinzip disposition with octave separation of manual and pedal divisions, 8', 4', 2' (Hitchin,[94] Dunchurch,[95] and Clifton, Nottingham[96]), 16', 8', 4' at Hexham;[97]

ii) manuals with octave separation at 8' and 4', (St. Mary's, Nottingham[98] and Mold[99]), or 4' and 2' at Shellingford;[100] but with a Pedal Organ of some four or five stops usually including a stopped 16' register, open 8', and a foundational reed at 16' or 8' pitch;

and

iii) a 'parent-child' relationship of <u>Hauptwerk</u> 8' and <u>Brustwerk</u> 2' (Keighley,[101] Chelsea,[102] Reading[103] and Blackheath[104]), in which case the pedal organ is usually confined to between one and three stops, 16'; 16', 16'; 16', 8', 16'; or 16', 4'.

The great majority of the <u>Brustwerks</u> have a 'swell' operated by pedal, e.g., Shellingford, Queen's, Nottingham (Clifton and St. Mary's), Mold, Reading (St. James'), Stoke d'Abernon, Hexham, a few such as Keighley and Cranford have hand-operated doors, but only one, the Freiburger Orgelbau instrument at Blackheath, eschews doors or shutters.

Such Brustwerk 'swells' are in general small divisions with clear classical roots; only at Hexham is the attempt made to provide a more romantically orientated division. It is perhaps also worthy of note that the 4' Brustpositive 'swell' organ at Queen's is less truly in prospect than appears at first sight. The tonal egress is considerably restricted at both top and bottom of the opening (the internal height being greater than the external height), and also by the presence of both shutters, shutter frames and carvings, though these latter can be completely opened (Appendix D, 13).

An alternative to the Hauptwerk/Brustwerk arrangement is that of Hauptwerk and Oberwerk. The Oberwerk may be unenclosed as in Collins' organ at Paddington Green,[105] or enclosed as a Swell (Winlaton;[106] Lancaster University;[107] Brompton, Little Oratory;[108] and University College School[109]), with varying degrees of success.

The Swell organ poses particular problems in two-manual organs, and once it becomes a relatively large division its placement becomes problematic. At Worksop[110] the Swell is forced into too low a position by the east window and thus dislocates the two 'sides' of the organ. At Streatham[111] it obtrudes above and behind the main case, indecisive as to whether it speaks into the Hauptwerk, in romantic manner, or over the Hauptwerk as a separate division. As has been commented in Chapter VII, the 1967 Harrison organ in the Royal College of Music, with Great and Swell on the same level produces a markedly poor action run, as also at Romford. Where the Swell and Great are close together, as in the Walker 'factory' organ,[112] tuning can be adversely affected by the position of the shutters. Possibly the least satisfactory solutions are those adopted by Harrisons at Fenham,[113] where the Unterwerk position for the Swell gives a bad action run, with consequent poor touch, and causes the player to receive the full force of the division (Appendix D, 113); or Collins at Brasenose College,[114] where the position of the Swell at right angles to the case also gave rise to problems of action run and balance in relation to the player. The difficulty of integrating a Swell Organ, without disturbing the essential classical balances, whether of registers or layout, is evident. By far the most satisfying solution seems to be to place the Swell in Oberwerk position, thus distancing it from the player. The *Brustwerk* position is satisfactory only in terms of a relatively small division, unless the organ has a 16' prospect which, as at Hexham, gives adequate height between console and impost for a large division.

Three- and four-manual organs all employ a *Werkprinzip* format, (though the fourth (Bombarde) manual at both Christ Church and St. Andrew's is effectively a part of the *Hauptwerk*):

HW, (BOM), RP, BW	(Clifton Cathedral,[115] New College[116] and Christ Church Cathedral[117])
HW, OW, BW	(Southampton,[118] Fulham,[119] York,[120] Woodford,[121] Huddersfield[122])
HW, (BOM), RP, SW	(Trinity College,[123] St. Andrew's[124])
HW, POS, SW	(Royal Northern College of Music[125])

Of these only the Clifton Cathedral organ has entirely consistent Principal octave separation, 16', 8', 4', 2'. At Southampton, Fulham and Woodford the only small compromise in this respect is the use of a stopped 16' and open 8' pedal basis. At Trinity College there is a minor compromise in that both *Hauptwerk* and Pedal have a 16' principal basis, while at Christ Church *Hauptwerk* and *Rückpositiv* have an 8' basis; in both instances this is due to the employment of old casework.

At New College, Christ Church, Woodford, Huddersfield, Royal Northern College and Trinity College, the presence of a large Swell division (not less than eleven stops), of 4' pitch basis, in the context of three- and four-manual organs, again shows the problem of locating such a division. Three of these, New College, Christ Church and Huddersfield, settle for the overtly *Werkprinzip* solution of making it a large *Brustwerk* with resultant distancing of the *Hauptwerk* from player, and also, at New College and Christ Church, from the *Rückpositiv*. Its presence in the prospect also denies it its romantic role and gives the player problems of balance and intensity. At the Royal Northern College the Swell is distanced from the player, but still stands as a separate division in prospect, though half-disguised behind vertical slats. At Woodford the use of a rectangular case allowed the Swell to be placed in *Oberwerk* position but within the main *Hauptwerk* case, satisfying to a considerable degree the demands of the Werkprinzip and classical balance, and also romantic timbre. A more restrained solution was that adopted by Metzler at Trinity College, where the Swell was regarded as a large 'Echo' located in the foot of the case, allowing it to have a delicacy and 'mystery' appropriate to the liturgical and romantic repertoire, though some would regard the division as lacking liveliness.[126] The matter of location of the moderate to large Swell Organ in a classical context seems inevitably to result in a compromise either in terms of the organ layout or the musical result, though to some extent this is a function of the size of the division, the building, or the organ. In none of the instances discussed does the Swell speak into the Great so as to modify its tone in the romantic manner. The solution adopted by Marcussen in the Gustavs Church, Copenhagen[127] and Metzler at Baden Cathedral[128] (of a free-standing division behind the Great), has not yet been tried in England, nor has there been an occasion to build a large Swell organ in the context of a 32' principal basis organ in England. Overall, however, the balances and timbres obtained by Grant, Degens and Bradbeer at Woodford, and Metzler at Trinity College, seem perhaps the most satisfying so far to player and listener alike.

The Pedal Organ calls for little comment where it is in prospect (e.g., New College and Clifton Cathedral) but where old cases have been re-used, as at Christ Church and Trinity College, problems have been encountered. At Trinity College there is excessive case depth and, as a result of the east and west prospects, some loss of direction to the sound. At Christ Church the use of a separate Pedal case behind the main case causes some loss of immediacy, especially to the player.

As shown, the Werkprinzip format is however capable of a remarkable flexibility, though remaining resistant to a full-scale romantic swell division. Its component parts can also be used separately, as at Kingston on the Hill and Haverfordwest, where a Rückpositiv on the gallery rail, giving maximum projection into the acoustic area, satisfies straightforward musical need. At Northampton Roman Catholic Cathedral, where tonal projection was vital in order to fill a large building with sound, using only ten stops, then two manual divisions were both placed on the gallery rail. Overall the dispositions adopted in recent years do not suggest that the classical concept of octave separation of manual and physical separation of divisions is in any way out-moded; rather do organs such as those in the Reid Hall, the Queen's College, Eton College, Nottingham Clifton, Southampton University, Trinity College and Robinson College show that the format is, as Zachariassen suggested, a natural acoustic and mechanical pre-condition for the emergence of an organ which is an individual, characteristic and artistic entity.

Stoplist

Full details of all the stoplists for classical organs built between 1955 and 1978 are given in the two volumes of The Classical Organ in Britain. Details of the organs built since then are to be found in Chapter VII. As Klais suggests, a stoplist "is not an independent quantity; it has, rather, to accommodate itself... to the spatial and acoustical realities of architecture and construction."[129] It is also determined by liturgical or musical need (real or imagined), and by particular national or builder styles. Its nomenclature can indicate the philosophy and intent of builder or consultant. At Shellingford the organ reform philosophy of Collins and Andrew Williams was shown by the names chosen, simple English names where possible. The adoption of the German Werkprinzip style is equally evident in the manual titles and stoplists of organs by Grant, Degens and Bradbeer: at York, totally German; at Oxford German Hauptwerk, Rückpositiv and Pedal, but with the Swell given French nomenclature. At Hexham, whilst a Werkprinzip disposition was adopted, the intention to root the organ in the French tradition was given expression in the stoplist. Builders working in a national style also use its traditional nomenclature, as have Tamburini and Ahrend. A change of nomenclature by builder or adviser can often be seen as reflecting a new stance by that individual, as shown by the use of traditional English stop names by Collins at Paddington Green, in contrast with the 'Englished', 'reformed', nomenclature at Southampton. It has to be admitted, however, that traditional English stop nomenclature where the 'Principal' so often appears as the octave of the main-division unison principal, is confusing in Werkprinzip terms.

The stoplists also demonstrate the musical interests of the period. Initially the interest was predominantly Germanic, reflecting Bach and Buxtehude, but tinged with French influence, both early and late, and, as at New College, touched by the German 'modernist' organ composers. Gradually as awareness of the nature of musical styles and organ building schools grew, more specific organ types have emerged, e.g., Hexham and Paddington Green indicate greater interest in the French and English schools. Though the stoplists show a shift of emphasis, the organs themselves remained 'post-Zachariassen' instruments. Towards the end of the 1970's the trend towards historic organ types becomes even clearer in the imported organs by Ahrend and Tamburini; in John Mander's, Smith-style organ in Pembroke College; and in the 'Frenchified' organ by Rieger in Christ Church.

In general terms the stoplists of the 1960's and early 1970's show an over-reaction which, as indicated by Glatter-Götz,[130] may be considered normal at a time of reform. Firm adherence to the Werkprinzip, a reduction of 8' registers, a development of chorus work, (often in conjunction with high-pitched mixtures), and the appearance of short resonator reeds. As Andersen commented about the early development of organ reform, "the ground had to be cleared in preparation for new ideas and some things had to be excluded for the time."[131]

The development of stoplists thus shows certain patterns. Leaving aside 'box' organs (where size determines the 2' principal basis and stoplist), small one-manual organs, with or without pedals, tend to consist of a stopped 8' register, a partially stopped 4', and an open, narrow-scale 2', with the addition of either a number of separate ranks (e.g., Woodley[132]) or a Mixture, usually of two ranks (e.g., St. Ives[133]). The larger one-manual, pedal-less organs tend to have an 8', 4', 4', 2', basis. Where a Pedal stop is present this chorus is usually completed with a Mixture, or separate ranks of 1 1/3' and 1', supplemented by a second, or even third, 8' stop. Up to 1974 a number of one-manual organs (e.g., Windsor;[134] St. Ives[135]), had a 16' short-resonator reed in the pedal, largely because of limited space or finance - a trend which ceased by the late 1970's. The first volume of The Classical Organ in Britain shows a tendency towards relatively high-pitched, 4' or 2' principal-basis, small one-manual organs. Volume 2 shows a movement towards larger one-manual organs, such as at Douai Abbey[136] and Digby Stuart College,[137] of up to eight or nine stops, coupled with an increase of 8' registers, no less than three (principal, flute and string), at St. Anne's, Reading.[138] A similar change in style is evident in Scandinavia, but occuring a few years earlier.[139] In England the reaction to the early reformed organs with their minimising of 8' registers, emphasis on higher pitches and exclusion of string stops, appears due to a less 'doctrinaire', or Orgelbewegung, approach to organ design, seemingly arising from a growing appreciation of historical and musical styles (especially in terms of small organs), coupled with a wish for a wider range of accompanimental timbres.

Two-manual organ stoplists can be considered in two groups: those with a main-manual 4' principal basis, and those with an 8' basis. Taking two-manual organs of more than six stops with a 4' Principal base, and excluding practice organs, an analysis of some twenty-six organs shows, as might be expected within a relative small number of stops between ten and twenty, a fairly clearly defined pattern.

Table VIII/1 Organs with a 4' Principal Basis

	HW	BW/OW	or	RP	P
Principals	4',Mix,(Sesq)	2',1 1/3(Mix)		2'	8'
Flutes	8',2',	8',4',(1 1/3)		8',4',	16',(8'),4'
Reeds	(8')	8',			16'

(Note: Hybrid stops have been allocated in 'simple' terms with either principals or flutes.)

Typical is the fourteen-stop Grant, Degens and Bradbeer organ at Dunchurch:

Table VIII/2 Dunchurch, Grant, Degens and Bradbeer, 1972

	HW	BW	P
Principals	4',II,IV	2'	8'
Flutes	8',2'	8',4',1 1/3'	16',4'
Reeds		8'	16'

Such a disposition, whilst adhering to the Werkprinzip, is perhaps wasteful in so much of the resources being taken up in the provision of an 8' Principal solely for use on the Pedal. Comparing such organs in the first volume of The Classical Organ in Britain with those in Volume 2, it is seen that 4' principal-base organs of up to twenty stops occur in the first volume, but in the second volume this drops to a maximum of fourteen stops with a 4' principal base, demonstrating an increase in the period of organs with an 8' principal base, a trend similar to that shown above in terms of one-manual organs, and seemingly for similar reasons. The larger the organ, the more the chorus requires an 8' Principal foundation. An analysis of some two-manual organs (including Brasenose College) with an 8' Principal base varying from seven to thirty-four stops shows the following characteristic format:

Table VIII/3 Organs with an 8' Principal Basis

	HW	BW/OW/RP/SW	P
Principals	8',4',(2'),Mix	4',2',1 1/3,(Mix)	8',4',(Mix)
Flutes	8',(4'),2'(Sesq)	8',4',(2'),(Sesq)	16',8',(4')
Reeds	8'	(16'),8'	16',(8'),(4')
String		8'	

(Note: Organs with 8' Principals having stopped basses are included.)

While such organs vary in size from Finchley to Hexham, e.g., seven to thirty-four stops, the broad trend is seen in organs such as Stoke d'Abernon or St. Mary's, Nottingham. Table VIII/4 also indicates the persistent influence of the Queen's College organ, which effectively sets the pattern:

Table VIII/4 The Queen's College, Oxford, Frobenius, 1965

	HW	BW	P
Principals	8',4',2',IV	4',(2),1 1/3',III	8',4',III
Flutes	16',8',Sesq	8',4',2'	16',8'
Reeds	8'	8'	16',4'

Only the Hauptwerk 16' Gedeckt, which is singular to Queen's, lies outside the pattern in Table VIII/3.

A partial exception to this trend is seen at Finchley and Wallsend where, on one-chest organs, there is a clear division of the principal and flute choruses between the manuals. Such organs are effectively one-manual organs placed on two keyboards for registrational convenience. Another significant feature shown in the above Tables is the relatively large proportion of wide-scale registers, especially at 2' pitch on the main manual, their presence, as at Pembroke College, often leading to a de-characterisation of the principal chorus.

The three- and four-manual organs divide according to their use of either a 16' or an 8' Principal basis of the main manual (for this purpose the four-manual organs at St. Andrew's and Christ Church are regarded as three-manual organs since the Bombarde divisions are an extension of the main organ). The pattern is again a fairly clear one. For some nine three-manual organs ranging from twenty-six to fifty-one stops it is as follows:

Table VIII/5 Three-Manual Organs

	HW	RP/OW/POS	BW	SW	P
Principals	8',4',2', (Sesq),Mix	4',2',Mix	2'	4'	(16'),8', 4',Mix
Flutes	16',8',4	8',4',2', 1 1/3	8',4',(Sesq) 1 1/3	8',4',(2'), (Sesq),Mix	16',8', (2')
Reeds	8'	8'	(16'),8'	16',8'	16',(8'), 4'
Strings				8',(8)	

Organs representative of this pattern are Clifton Cathedral, Woodford, New College and St. Andrews.

It is interesting to compare the above Tables, VIII/3 and 5, with that of Brouwer[140] for some fifty Frobenius and Marcussen organs:

Table VIII/6

	HV	RP	BV	P
Principals:	8'-4'-2'	4'	2'-1 1/3'	8'-4'-2'
Weitchor:	8'-4'	8'-4'-2'	8'-4'-2'	16'-8'
Solostimmen:	(Ged pommer 16')	(Qtn.8')		
Zungen:	8'	Dulc.8'oder Krh.8'	16'oder 8'	16'-(8')-4'
Mixturstimmen:	Mixt.(Cymbel)	Scharf (Sesq.)	(Cymbel)	(Mixt.)

The most noticeable difference is the importance given to the Swell Organ in Britain (though both Marcussen and Frobenius used such divisions, with both strings and reeds, in the 1950's and 1960's and more recently[141]). Also the Sesquialtera is more often found in the Great or Swell organs on British organs rather than in the Rückpositiv.

The stoplists of the two 16' principal-base organs, Trinity and Christ Church, follow in broad terms the overall three-manual pattern; both have Rückpositiv and Swell organs. The 16' basis for the stoplist lies in the size of the Smith cases, both of which originally had GG prospects.

Tremulants

Despite an article on the use of the Tremulant by Susi Jeans in 1950[142] the literature reveals very little about the construction of tremulants; neither edition of The Organ Today by Herbert and John Norman even mentions the Tremulant, and The Organ by Sumner only mentions the historic use of the stop. Three types of Tremulant have been used in recent classical organs: pneumatic valve tremulants[143] as at Queen's, which produce variations in the pressure in the wind trunk; electrical tremulants, as at New College and Clare College, which affect the movement of the 'pan' of the in-built regulator; and the Tremblant doux[144] of Bedos, which produces variations in the pressure in the wind trunk. This latter form has been seen as the most 'classical' form of tremulant and is found on more historically oriented organs such as the Reid Hall, Wallsend and Blackheath organs.

Winding

Of fundamental importance to any organ is its wind supply: as Janke has commented; "the influences of the blowing system on organ tone are more important than tricky scaling, high-content alloy or even the back of the organ case."[145] The wind supply is also a matter which is "least understood,"[146] whether from a technical or musical viewpoint.

In England the horizontal reservoir, or bellows (first with feeders and later fed direct from the blower), which had replaced the older style wedge bellows, remained in general use into, and in some instances beyond, the 1950's. The classical revival of the 1950's saw the growing use of the 'in-built regulator', or Schwimmer. Invented by Maag[147] it consists of a wind box below the wind chest, its lowest side being a wooden plate, or Schwimmer suspended either from a flexible leather surround with or without the use of ribs.[148] Wind enters the box from the blower and the pressure is maintained by 'harmonium' springs, as for example at Queen's College, or by parallelogram springs, as at New College and Clifton Cathedral.

Relatively little has been written about the functioning of inbuilt regulators; indeed Andersen in Organ Building and Design does not discuss them at all. As shown in the drawing of the Finchley organ (Appendix D, 78) they do have the enormous advantage of taking up virtually no space. When carefully adjusted, for example, with Rieger-style parallelogram springs, they can provide a very, almost 'rock steady', wind supply.[149] This 'rock steady' quality wind supply from inbuilt regulators has however been criticised and described as 'hard-sounding' and 'inflexible', by builders such as Fisk,[150] Noack,[151] and Janke.[152] As Magnusson suggests, whilst such regulators give an almost absolutely stable wind pressure, yet,

> "These 'good' bellows often have a tendency to other problems which are sometimes quite obvious. The problems in question are the pressure deviations which are small compared to the voicing pressure and often vary so quickly that the water-manometer doesn't register them." 153

The deviations cause a 'jittery' or 'fluttering' instability and would appear to be due, as Magnusson indicates,[154] to a variety of factors, the low weight (and hence low inertia), coupled with inadequate damping, either internal or external (a traditional wedge bellows or horizontal reservoir has considerable inherent damping). The bellows plate may thus vibrate at the frequency of nearby pipes, it may vibrate at the pulsing rate of a reed tongue, or it may vibrate in concert with the movement of the inlet valve, all of which can affect the wind supply adversely. Inspections of recent instruments with inbuilt regulators, e.g., Clifton Cathedral and Bryanston School, tend to confirm Magnusson's observations. It is interesting to note however that The Queen's College organ has inbuilt regulators with a trapezoidal plate, hinged on the long side, the pressure being maintained by harmonium springs. Such a system does seem largely to obviate the problems discussed above, especially when used in conjunction with a smoothly functioning control, or inlet, valve.

A reaction to inbuilt-regulator winding is now clearly observable. In the first Volume of <u>The Classical Organ in Britain</u> almost all the organs listed had some form of inbuilt regulator. By the time Volume 2 was published it was possible to write:

> "In a number of organs in this volume, by Ahrend, Metzler, Tamburini, Freiburger Orgelbau, Mander, Collins and Church there is seen the rejection of 'Schwimmers' or inbuilt regulators, and the employment of more 'breathing' forms of wind supply. This 'breathing' wind is perhaps best exemplified in organs such as that by Ahrend, in the Reid Hall, Edinburgh, or Collins at Paddington Green, where traditional wedge bellows are used." 155

Such wedge bellows with their process of inhaling and exhaling do 'breathe'. The mechanisms involved are clearly shown in Bunjes The Praetorius Organ,[156] though in all instances in this country they are fed from a blower, and not cocked by hand.[157] Other forms of 'flexible' winding have been employed, usually in the form of a box reservoir with either a weighted lid hinged at one end, as at Blackheath[158] and Kingston on Thames,[159] or a horizontal upper lid, similar to a Schwimmer, the pressure being maintained by springs, at Hoveton,[160] or a combination of springs and weights as at Wallsend.[161] In these latter cases the wind supply at the pipe foot is 'cushioned' by the quantity of air in the wind trunk. Both the trunking and the windbox beneath the chest are important factors. Traditionally, in the historic classical organs such as Steinkirchen,

> "from the bellows stack a single wooden duct of modest rectangular cross section (say 4 inches by 10 inches) traversed the distance to the organ case. There the duct divided into ducts of somewhat smaller section and these led to the windboxes of the several windchests in the organ. It is significant that these windboxes were seldom much larger in cross section than the ducts which fed them." 162

The tendency to revert to wind trunks of "modest" dimension is evident in the period under review.[163]

Fisk goes on to suggest that when all is in agreement the relationship between key, pallet and wind is very direct, producing a downward pulse, or pressure fluctuation, when the pallet is opened and an upward pulse when it shuts, an effect that can "mark the comings and goings of an inner part,"[164] and also means that "the pulses from one keyboard will be marked in the sustained notes of another; it also means that the sounds of full organ, coming as it were from one giant pair of lungs, will have a unity of mass achievable in no other way.[165] A similar opinion has been voiced with regard to the Metzler organ at Fraunfeld:

> "A flexible wind supply with accurately proportioned channels and bellows, without the normal regulators guarantees vocal pipe-speech generated by flowing wind. The organ makes one realize that it is a big wind instrument. The broadly flowing tonal entries seem to suggest a choir's breathing." 166

Whilst as yet few data are available on the precise nature and functioning of such winding, the return of a more singing organ style is clear in the rejection of inbuilt regulators. In this context of the organ as a large wind instrument which breathes, it should be commented that no normal musical performance with wind instruments involves the employment of steady wind, though of course any musical activity requiring wind supply must be stable enough for satisfactory tuning in chords. As Stravinsky said of the organ:

> "I dislike... the fact that the monster never breathes," and he went on to comment, "The breathing of wind instruments is one of their primary attractions for me." 167

Windchest

The windchest is "the nucleus of organ building technology",[168] and has "a decisive influence on the tone quality".[169] Amongst organ builders today, as shown in their writing and work, there is general agreement as to the superiority of the slider chest, and chests of this type have been employed without exception in recent classical organs in England. The form, "a flat box-shaped oblong construction divided into narrow cavities (called channels or wind-grooves beneath each of which is a pallet) by means of interstices (called bars) each channel supplying wind to all pipes having the same keynote",[170] is described in general in standard works such as Organ Building and Design, The Organ Today, The Organ Handbook, The European Organ, or 'Dom Bédos'. More detailed surveys of its development and present-day forms of construction are given by Schumacher[171] and Laible.[172]

The principal advantage of the slider chest, stated by all the writers mentioned above, is that of giving good blend. Andersen suggests that this is due to the fact that:

> "When vibrations of these pipes are transmitted into this groove, a vibration coupling results, which, to a considerable degree, promotes the blending. The pipes on the same groove are well suited for coupling, because their frequency is a multiple of the frequency of the fundamental." 173

It has also been suggested that the planting of higher- and lower-pitched pipes above a groove and pallet assist in the overall speech of a chorus, the faster-speaking, shorter pipes helping the larger and slower pipes into prompt speech.[174] The slider chest has further advantages: it is able to feed several pipes from one pallet, is basically simple in construction and can be made resistant to changes in temperature and humidity. Its principal 'disadvantages' are that it requires the use of first-class materials and workmanship.[175]

The main problems of construction, as demonstrated by Schumacher,[176] Laible[177] and Andersen[178] all centre on the matter of air leakage, principally around the holes in slider and chest beneath the pipe foot.[179] To obviate this, three principal types of slider seal have been used in recent classical organs. Spring-loaded seals were used for example by Flentrop at the Queen Elizabeth Hall, and by Collins at Shellingford;[180] telescopic spring sleeves, after a design by Starup,[181] have been used by various builders, such as those made by Verschueren and used by Grant, Degens and Bradbeer at New College.[182] These relatively complex devices, and others described by Schumacher,[183] were superseded by the production of plastic foam disc seals by Gerhard Schmidt in 1969.[184] The seals are fixed to both the table and upperboard, the slider moving between the two seals. Air-tightness is maintained by the resilience of the plastic foam.

These Schmidt seals, used by Collins for example at Henley, were marketed by Laukhuff, and have been very widely used. A similar seal was marketed in England under the name Tygaflor, and used by Grant, Degens and Bradbeer from 1979.[185] Such plastic disc seals have the advantage of being readily renewable without major change to the windchest. Another form of seal, used by Grant, Degens and Bradbeer at Woodford is the Schumacher - Stulpdichtung - a device doing away with upperboards and giving a separate, controllable wind supply to each pipe.[186] This system, Schumacher suggests, reduces turbulence and "forms the shortest possible windway between the pipe foot and the bar channel. The closeness of the pipes to their bar channel produces ideal tonal blend."[187]

The materials used in the construction of slider chests have changed greatly in the second half of the century. Historically all parts of the chest were made of solid timber, usually oak and in later years mahogany. Interest in new materials in the 1960's, plywood, hardboard, chipboard and plastics, led to their use in windchests; e.g., at New College, upperboards, bearers and faceboards were of plywood; the table of chipboard; and sliders of double-faced hardboard. The use of chipboard proved unsatisfactory, its inconsistent density resulting in wind leakages which were difficult to trace. Gradually during the 1970's a reaction against the use of such materials is discernible. Chipboard ceased to be used in good quality work, and marine quality plywood became commonly used for windchests, e.g., Henley, Clifton Cathedral, sometimes as at Clifton with a mahogany upperboard, and often in conjunction with plastic sliders, e.g., by Freiburger Orgelbau at Douai. Plywood, as also chipboard, whilst being a very stable material, may be seen as having less than desirable qualities acoustically. The 'damping' effect of plywood is well known in the audio world. At Trinity College, as in the little organ at Woodley, the chests were, however, of solid oak. The use of solid timber, especially oak, by builders such as Metzler, Tamburini and Ahrend appears to reflect a belief that in using "all-wood construction any sound-distorting effects are avoided."[188]

Pallet design in England has seen a similar change, from 'new' to 'old' materials, from 'T' section aluminium pallets in organs such as Shellingford and New College in the 1960's, to long, narrow wooden pallets in the mid-1970's at the Royal School of Church Music, Henley, and later Coxwold and Wallsend. The size and placing of the pallet "has an important bearing on good windchest design... where pallet size so directly affects the weight of key touch."[189] The introduction of "the pallet board which enables builders to use small pallets and openings and yet keep large enough bar spaces proportionate to the requirements of air flow and spacing"[190] has been a significant development in recent years. The pallet openings "which strongly influence the touch"[191] may thus be kept small. Both Collins[192] and Church[193] following Zachariassen[194] show clearly the importance of keeping pallets long and narrow. Church also draws attention to the need to taper the depth of the pallet from pivot to pull-down.[195]

Jointed pallets, used initially (and later replaced by normal ones), at Hexham,[196] do not appear to have been employed elsewhere. Thus the views of Schweitzer at the start of the century, and Zachariassen at its mid point, as to the virtues of the slider windchest appear to be confirmed by present-day practice in Britain.

Pipe Materials

The general trends are shown in Tables VII/1-VII/29 in Chapter VII. These indicate that Principals tend to have a high tin content, 60-95%, though the larger pipes are sometimes of copper. Flutes have a lower tin content, around 20-50%. Whilst the general trend is consistent, some exceptions and changes in practice are discernible. Janke wrote that "tin alloys are not necessarily an indication of quality. For centuries builders have made pipes with a high lead content, partly intentionally,"[197] however, as the seventeenth- and eighteenth-century North German organ builders recognised,[198] high tin-content pipework does make a fine prospect; it is strong and not liable to collapse unless the pipe walls are too thin. Such pipework is valued for its bright tone, a feature which is accentuated if the pipe walls are thin.[199] Pipework with a high lead content gives warm flute tone, but, as old Italian,[200] English,[201] north-German organs[202] and more recent organs by Metzler and Tamburini show, it is also possible to obtain a warm and bright principal tone from such pipework. Lead pipes are softer and liable to collapse and damage when cone tuned, but when, as in a number of organs by Metzler, Tamburini and Schumacher, the metal is hammered (a process described by Dom Bédos[203] and used by the very early North German builders[204]), the soft metal appears to acquire not only rigidity but also tonal qualities of richness and blend. The opposite tendency appears when hard, rolled tin is used. The resulting tone is sharp, brittle and lacking in blend, e.g., Worksop Priory and, in general, its use has been abandoned by discerning builders. Traditional cast metal, whether hammered or not, appears more satisfactory. It would seem that the process of rolling the metal does not encourage 'molecular integration' and the formation of 'semi-metallics', as does hammering. This may be responsible for the 'unstable' or 'edgy' sound produced by rolled pipes.

Hammering, especially in conjunction with minor impurities, can result in the formation of very stable molecular structures, which, in turn, can reinforce certain overtones. At present although the preference for hammered metal by builders such as Metzler and Ahrend remains an aspect of experience, there seem grounds for considering that this probably has a sound physical and mechanical basis.[205]

Ranks of pipes are usually made of the same material throughout, the main exception being bass notes of copper,[206] wood[207] or zinc.[208] A different approach has been shown by Collins in a number of organs, e.g., Henley, Southampton University and Paddington Green, in which 20% tin is used in the lowest three octaves, and 75% tin in the higher octaves, of principals. Whether such a procedure is determined by economy or not remains unclear. The view is taken by Noack, who uses "mostly 25% metal, occasionally 75% tin for a Principal, or just the upper end of one," is that "the big pipes do not gain from all that tin."[209] Whereas in the case of Tamburini the use of high tin content prospects allied to low tin content interior pipework is part of a long tradition,[210] a similar use by Church appears to be simply a matter of economy,[211] though, as implied above in relation to old north-German organs, the 'tradition' may be economic in origin. Economy is a dominant factor in relation to prospect pipes: large tin pipes are expensive, and the use of copper (Laycock and Bannister, Keighley), plain zinc (Mander, St. Paul's School), and polished zinc (Walker, University College School), is attributable to their lower cost. The use of spotted metal prospects, thought of in pre-War years as a mark of 'good quality', is rare in recent classical organs, though John Budgen, of Bishop's, used these at Christ the King, Reading, and Lancaster University.

One aspect of metal pipework, which has been much discussed in recent years, is that of 'aging'. As Zachariassen suggested, "the tone of the old organs rests... on a progressive refining of the pipe metal in the course of time,"[212] and that "one should therefore avoid too wide scales, especially for the manual principals, the tone of which otherwise becomes too full and lacking in penetration later."[213] Andersen, as also Zachariassen, notes that this change can "be traced when the pipes are only ten years old,"[214] going on to propose that "a certain individual adjustment must occur between the vibrations of the air in the pipe and the resulting vibrations of the pipe wall; and we know that this adjustment... is perceptible in a shifting of the tonal balance in favour of the fundamental."[215] The extent to which such change occurs remains a matter for debate amongst organists and organbuilders,[216] as also the reasons for any tonal change - some of it could be due to no more than dust settling in the pipe - and a carefully controlled long-term study is necessary to confirm or deny the experiences quoted by Zachariassen and Andersen.

When pipes are made of wood there seems a preference for either soft pine or similar species, though oak and mahogany are also used. Mahogany does, however, as at Wallsend, appear to produce hard 'chippy' transients which are difficult to control, unlike oak, which remains, as in Smith's day, an excellent, if expensive material. As Andersen suggests, "wood is an excellent pipe material,"[217] and the growth of small organs[218] with many wooden pipes reflects a growing interest in a particularly English aspect of organ building. The presence of wooden basses within a case is also thought by some builders to be beneficial tonally to the whole organ.[219]

A trend is thus evident, exemplified in the rejection of rolled metal, and the growing use of hammered metal, in which there is a search for richer and better blending pipework, a search which is in part a reaction to the early 'sharp' classical organs, and which shows a growing knowledge and appreciation of the work of earlier builders. It also indicates the growing experience of the younger school of classical builders.

Wind Pressures

The pattern set by Frobenius at Queen's; Hauptwerk, 60 mm; Brustwerk, 52 mm; Pedal, 65 mm; was, in broad terms, followed by other builders in Britain. The general trend, as derived from Chapter VII, is of pressures around:

Table VIII/7

Hauptwerk	60 - 65 mm
Brustwerk, Rückpositiv or Oberwerk	50 - 55 mm
Swell	60 - 75 mm
Pedal	60 - 80 mm

Usually the second manual pressures are some 5 mm lighter than those of the main manual, and the Pedal some 5 - 15 mm higher than the main manual. An exception, in the case of the second manual, is at Christ Church Cathedral where the Choir (Rückpositiv) pressure is some 15 mm lower than the Great - a matter possibly reflecting the location of the division close to singers and congregation. Swell organs tend to have higher pressures than the Great, up to 13 mm more, though again Christ Church does not conform to the pattern the Swell pressure being 5 mm lower than the Great, a difference, however, consistent with its Brustwerk position. It should also be noted that a number of organs, e.g., Henley and Keighley, have Great and Pedal organs combined on the same chest and at the same pressure, and that at Edinburgh the Ahrend organ is all on 63 mm, from the one wedge bellows. Most noticeable are the relatively high pressures adopted by von Beckerath at Clare College, 70 mm for the Hauptwerk and Brustwerk and 80 mm for the Pedal, pressures 10 mm, almost 20 mm, and 15 mm higher than for the comparable manuals at Queen's - and this in a much smaller chapel. There can be little doubt that the high pressures at Clare, especially that of the Brustwerk, are a significant factor in the organ being over-loud for the chapel. At the other extreme is the Tamburini organ in Douai which, winded on barely 40 mm, is able to fill a large reverberant Abbey Church.

The average pressures, given above in Table VIII/7, are very similar to that of Steinkirchen[220] - the 'model' for Queen's - as also to the pressures used by Andreas Silbermann[221] (though in the 16th, 17th and 18th centuries manual pressures seem to have varied from 42 - 55 mm in 16th century Italy and Spain to 85 - 94 mm on the part of builders as diverse as Niehoff, Ebert, Schnitger and Gottfried Silbermann).[222]

The extent of the revolution in the post-1950 period in terms of pressure can be seen viewed against pressures common earlier in the century e.g., Sacred Heart Church, Wimbledon (Walker 1912):[223]

Great and Swell Flues	127 mm
Great and Swell Reeds	190 mm
Pedal Flues	136 mm
Pedal Reeds	317 mm

King's College, Cambridge (Harrison 1934):[224]

Great Flues	100 mm
Great Reeds	457 mm
Swell Flues	89 mm
Swell Reeds	177 mm
Choir Flues and Reeds	76 mm
Pedal Flues	76 mm - 100 mm
Pedal Reeds	127 mm - 457 mm

or even against the pressures at Coventry Cathedral (Harrison 1962):[225]

Flues	90 mm - 127 mm
Reeds	127 mm - 304 mm

Allied to this change of pressure is, of course, the change in voicing style, from closed feet and heavy nicking, to open foot, 'nick-free' voicing.

Pipe Dimensions - Flues

The timbre and intensity of a pipe are determined by four principal factors: materials, pressure, diameter and mouth width and height. Of these the most 'conclusive' feature in terms of sound quality is the scale, or diameter.[226] This influences the 'extensity' of sound, or its capacity to fill a given acoustic space.[227] Andersen discusses this in terms of cross-sectional area, suggesting that:

> "Generally pipes with a large cross-section in relation to length have a dominating foundation pitch and weaker harmonics, that is a soft and flute-like sound, while pipes with a smaller cross-section in relation to length have stronger harmonics and a weaker foundation pitch, that is a bright and more 'stringy' sound." 228

He also points out that the harmonic spectrum of the pipe is further influenced by the shape of the pipe body, as also by closure or partial closure of the top.[229] The mouth dimensions, width and height ('cut-up') influence chiefly loudness and timbre. The wider the mouth the louder the sound, the lower the cut-up the richer, and less 'fluty', the tone.[230] Assuming an open pipe foot, the tone and loudness are also influenced by the size of the flue, within the limits indicated by Forsyth-Grant,[231] and the position and angle of the languid in relation to the upper and lower lip.[232] Closing the pipe foot reduces the loudness of the pipe, and is effectively a selective reduction of wind pressure.[233]

Pipe Scales

As Schweitzer commented "with scales and wind pressures we are at the heart of the problem."[234] Chapter VII and Appendix B contain full details of representative scales and pressures for a significant number of classical organs built in England between 1965 and 1980. The origins of scaling practice are discussed by Andersen in Organ Building and Design.[235] The term 'scale' can apply to both the length and diameter of pipes. As the calculation of pipe length is a matter of simple proportion (though adjustments to theoretical lengths have to be made in practice),[236] and is of less significance in terms of timbre,[237] the term scale will be taken here to refer to pipe diameters and their relationships one to another within a rank. Scales can take one of three basic forms: scales in which the octave ratio remains constant throughout the rank (constant scales); scales based on a constant ratio, but with the addition or subtraction of a constant amount (fixed-variable scales); or scales which vary inconsistently throughout their compass (free-variable scales).[238]

The scalings in Chapter VII show the general practice to be the use of free-variable scales. These are, however, as Bunjes comments, "not susceptible to mathematical analysis,"[239] though some general trends are observable. Thus for the builder "each particular case must be independently resolved in accordance with the prevailing conditions,"[240] i.e., the size, volume and acoustic of the building. Despite this, individual builders do appear to prefer to use particular scale forms, which, to some extent, characterise the tonal qualities of their organs.

In any organ the most significant register is the basic principal stop, a stop particularly important when at unison pitch. An analysis of some twenty organs with a main manual 8' principal basis (Table VIII/8), does show a number of factors. The organs tend to fall into two groups, those with principal scales between 130 mm - 140 mm, generally in small to moderate sized buildings, e.g., Reid Hall, Henley, Queen's, Trinity, and organs with scales of between 148 mm and 155 mm. These latter organs tend to be in moderate to larger buildings e.g., New College, Mold, Clifton Cathedral, Douai Abbey and Christ Church. In all cases mouth widths are normally around 1/4, 1/4.5, or in the case of Collins at Paddington Green and Henley 1/3.8, and wind pressures are between 60 mm and 65 mm. An exception to the pattern is the von Beckerath organ in Clare College where the Principal 8' has a diameter of 142 mm, with a small (1/4.5) mouth width, but a pressure of 70 mm. The preference of builders for either a 'narrow' or a more 'normal' scale is clear from Table VIII/8. Frobenius, Ahrend, Collins, ten Bruggencate, and Smith/Metzler lie in the 130 mm - 140 mm narrow 'Scandinavian' range; and Rieger, Grant, Degens and Bradbeer, J. W. Walker, Thurlow, Church/Lhôte, and Tamburini the 148 mm - 155 mm

Table VIII/8

Diameters, mouth-widths, cut-ups and wind pressures for some 8' principal base organs

Organ	Builder	ϕ	Relative Scale	mw	cu	WP
Reid Hall	Ahrend	130	−4			63
Paddington Green	Collins	130	−4	1/3.8		60
Cranford	Collins	135	−3½	1/4		60
Henley	Collins	135	−3½	1/3.8		60
Southampton	Collins	135	−3½	1/4		65
Woodford	GDB	135	−3½	1/4	1/4	60
Northampton	ten Bruggencate	135	−3½	1/4	1/4	65
Trinity	Smith/Metzler	138	−3	1/4		
Queen's	Frobenius	138	−3	1/4	1/4	60
St. Paul's Boys Sch.	Mander	140	−2½	1/4		63
Huddersfield	Wood	140	−2½			60
Clare	von Beckerath	142	−2	1/4.5		70
New College	GDB	148	−1	1/4		63
Mold	Rushworth	148	−1	1/4		60
Wallsend	Church/Lhôte	150	−1	1/4.4		55
Bryanston	Church/Lhôte	150	−1	1/4		65
University Coll. Sch.	J.W. Walker	150	−1	1/4		65
Keighley	Laycock & Bannister	152	−½	1/4	1/4	50−55
Clifton	Rieger	155	0	1/4.4		60
Douai Abbey	Tamburini	155	0	1/4.5	1/4	38−40
Christ Church	Rieger	155	0	1/4	1/4	65

Table VIII/9

Some 8' Principal scales in ascending order of diameter

Organ	Builder	ø C	8ve ratio	ø c	8ve ratio	ø c'	8ve ratio	ø c''	General Scale Form
Reid Hall	Ahrend	130	1:1.68 $1:\sqrt[4]{8}$ ½ on 17	77	1:1.66 3:5	46	1:1.75 4:7	26	V
Paddington Green	Collins	130	1:1.75 4:7	73	1:1.63 $1:\sqrt{2\frac{2}{3}}$ ½ on 18	44.5	1:1.66 3:5	26.5	V
Cranford	Collins	135	1:1.71 7:12	79	1:1.63 $1:\sqrt{2\frac{2}{3}}$ ½ on 18	48.5	1:1.63 $1:\sqrt{2\frac{2}{3}}$ ½ on 18	29.5	V
Henley	Collins	135	1:1.18 5:9	75	1:1.66 3:5	45	1:1.73 $1:\sqrt{3}$ ½ on 16	26	V
Southampton	Collins	Virtually identical with Henley							
Woodford	GDB	135	1:1.66 3:5	81	1:1.66 3:5	48.1	1:1.16 5:8	30.1	R
Northampton	ten Bruggencate	135	1:1.55	88	3:5	52.5	½ on 17	31	R?
Trinity	Smith/Metzler	138	1:1.73 $1:\sqrt{3}$ ½ on 16	81	1:1.68 $1:\sqrt[4]{8}$ ½ on 17	48	1:1.71 7:12	28	F
Queen's 1	Frobenius	138	1:1.8 5:9	76	1:1.8 5:9	42	1:1.6 5:8	26	F/V
Huddersfield	Wood	140	1:1.68 $1:\sqrt[4]{8}$ ½ on 17	83	1:1.68 $1:\sqrt[4]{8}$ ½ on 17	49	1:1.68 $1:\sqrt[4]{8}$ ½ on 17	29	F
St Paul's Boys Sch.	Mander	140	1:1.85	76	1:1.58 $1:\sqrt{25}$ ½ on 19	48	1:1.63 $1:\sqrt{2\frac{2}{3}}$ ½ on 18	29	V
Clare	von Beckerath	142	1:1.63 $1:\sqrt{2\frac{2}{3}}$ ½ on 18	86	1:1.55 2:3	51	1:1.8 5:9	29	R/V
New College	GDB	148	1:1.73 $1:\sqrt{3}$ ½ on 16	85	1:1.68 $1:\sqrt[4]{8}$ ½ on 17	50	1:1.73 $1:\sqrt{3}$ ½ on 16	29	F
Mold	Rushworth	148	1:1.75 4:7	84	1:1.66 3:5	50	1:1.55	32	R/V

Table VIII/9 contd.

Organ	Builder	ϕ C	8ve ratio	ϕ c	8ve ratio	ϕ c'	8ve ratio	ϕ c''	General scale form
Wallsend	Church/Lhôte	148	1:1.73 $1:\sqrt{3}$ ½ on 16	85	1:1.8 5:9	47	1:1.8 5:9	26	F
Bryanston	Church/Lhôte	150	1:1.75 4:7	86.5	1:1.85	47	1:1.66 3:5	28	F/V
University Coll Sch.	J.W. Walker	150	1:1.73 $1:\sqrt{3}$ ½ on 16	86	1:1.68 $1:\sqrt[4]{8}$ ½ on 17	51	1:1.63 $1:\sqrt{2\frac{2}{3}}$ ½ on 18	31	F/V
Keighley	Laycock & Bannister	152	1:1.75 4:7	87	1:1.71 7:12	50.8	1:1.63 $1:\sqrt{2\frac{2}{3}}$	31.7	F
Clifton	Rieger	155	1:1.95	80	1:1.71 7:12	48	1:1.7 7:12	27.5	F
Douai Abbey	Tamburini	155	1:1.95	80	1:1.8 5:9	44	1:1.68 $1:\sqrt[4]{8}$	26	F
Christ Church	Rieger	155	1:1.73 $1:\sqrt{3}$ ½ on 16	88	1:1.73 $1:\sqrt{3}$ ½ on 16	50	1:1.66 3:5	30	F/V

Note: Scales with 8ve ratios from 1:1.68 (½ on 17) to 1:1.95 are designated falling scales (F).
Scales with 8ve ratios from 1:1.66 to 1:1.55 are designated rising scales (R).
Thus general trends can be seen: i.e. in the first instance the halving measure is more rapid leading to a narrowing from bass to treble, in the latter instance the halving measure is slower leading to a widening from bass to treble.
Variable scales are denoted by the letter V.

range (the 'top' of which is approximately 'Normal' measure). It would also appear to be the case as shown in Chapter III, that in the 1960's and 1970's both Marcussen and Flentrop favoured the 130 mm - 140 mm range, a factor which influenced Collins.[241] The group of builders using the 148 mm to 155 mm range is of interest in that the scales confirm the relationships indicated in Chapter VII between Glatter-Götz of Rieger, Grant, Degens and Bradbeer, and Lhôte. Also interesting is the virtual identity of the Walker and Thurlow scales, at University College School and Keighley, as also their similarity to Downes' scale from C - c'' for the Principal 8' at Brompton Oratory.[242]

As shown in Table VIII/9, from one octave to another the diameters vary within the following limits:

C	130 - 155 mm	(-4 to 0 HT)
c	73 - 80 mm	(-5 1/2 to -3 1/2 HT)
c'	42 - 52.5 mm	(-6 to -1 HT)
c''	26 - 32 mm	(-5 to -1/2 HT)

and the octave ratios employed run from almost 1:2 (1:1.95) to 1:1.5; the variability from octave to octave being as follows:

C - c	1:1.95 to 1:1.55
c - c'	1:1.85 to 1:1.63
c - c''	1:1.58 to 1:1.18

It is also seen that the general rate of halving is characteristic of groups of builders (allowing for a general tendency to widen the trebles). The organs by Ahrend, Smith/Metzler, Frobenius, Grant, Degens and Bradbeer, Church/Lhôte, Walker, Rieger, Tamburini and Wood tend to employ 'falling' (F) scales (i.e. in general halving on the 17th or earlier), whereas ten Bruggencate and von Beckerath employ 'rising'(R) scales such as 3:5 or halving on the 18th or later. Collins, Alistair Rushworth and Noel Mander adopt a much more variable (V)

Table VIII/10

Diameters, mouth-widths, cut-ups and pressures for some 4' principal base organs

Organ	Builder	ϕ	MW	CU	WP
Nottingham, Clifton	Marcussen	74·5	1/4·25		65
Royal College of Music	Harrison	76	1/4		70
Coxwold	Church	76	1/4	1/4	
Mitchell Hall	R.H. Walker	77	1/4	1/4	55
QEH	Flentrop	78	1/4		70
Douai Abbey (Chapel)	Freiburger Ob.	78	1/4·2		65
Dunchurch	GDB	79	1/4	1/4	
Reading, Christ the King	Bishop	79	1/4	1/4	
Positive	ten Bruggencate	80	1/4		
Hoveton	Church	80	1/4·5		
Shellingford	Collins	85	1/4	1/4	55
Kingston	Mander	88	1/4		
Blackheath	Freiburger Ob.	92			

Table $\overline{\text{VIII}}$/11

Some 4' Principal scales in ascending order of diameter

Organ	Builder	ϕ C	8ve ratio	ϕ c	8ve ratio	ϕ c'	8ve ratio	ϕ c''	General scale form
Coxwold	Church	76	1:1.68 $1:\sqrt[4]{8}$ ½ on 17	45	1:1.68 $1:\sqrt[4]{8}$ ½ on 17	27	1:1.68 $1:\sqrt[4]{8}$ ½ on 17	16·3	F
Mitchell Hall	R.H. Walker	77	1:1.73 $1:\sqrt{3}$ ½ on 16	44.5	1:1.73 $1:\sqrt{3}$ ½ on 16	26.8	1:1.58 $1:\sqrt{2.5}$ ½ on 19	16·9	F/V
QEH	Flentrop	78	1:1.66 3:5	47	1:1.68 $1:\sqrt[4]{8}$ ½ on 17	28	1:1.55	18·5	V
Douai Abbey (Chapel)	Freiburger Ob.	78	1:1.71 7:12	45.5	1:1.66 3:5	27.5	1:1.75 4:7	15.7	F/V
Dunchurch	GDB	79	1:1.71 7:12	46·3	1:1.75 4:7	26	1:1.6 5:8	16	F/V
Reading, Christ the King	Bishop	79	1:1.8 5:9	44	1:1.63 $1:\sqrt{2\frac{2}{3}}$ ½ on 18	27	1:1.68 $1:\sqrt[4]{8}$ ½ on 17	16	V
Positive	ten Bruggencate	80	1:1.68 $1:\sqrt[4]{8}$ ½ on 17	47	1:1.73 $1:\sqrt{3}$ ½ on 16	27	1:1.75 4:7	16	F
Hoveton	Church/Lhôte	80	1:1.75 4:7	45	1:1.75 4:7	25.5	1:1.75 4:7	14.5	F
Kingston	Mander	88	1:1.66 3:5	52.5	1:1.63 $1:\sqrt{2\frac{2}{3}}$ ½ on 18	32	1:1.68 $1:\sqrt[4]{8}$ ½ on 17	19	R
Blackheath	Freiburger Ob	92	1:1.85	50	1:1.85	29	1:1.6 5:8	18	F/V

approach to scale progression. The scales for principals, as also other registers, are thus seen as lying broadly within the parameters given in Chapter Three of Andersen's Organ Building and Design.

For organs with a 4' principal base some nine organs were analysed as in Table VIII/10. This showed the scales as falling within the following range:

C	76 - 92 mm	(-4 1/2 to -1/2 HT)
c	44 - 52.5 mm	(-5 to -1 HT)
c'	25.2 - 32 mm	(-4 to 0 HT)
c''	15.7 - 19 mm	(-5 to 0 HT)

and falling within the following range of octave progression ratio:

C - c	1:1.8 to 1:1.85
c - c'	1:1.73 to 1:1.85
c' - c''	1:1.68 to 1:1.55

The general tendency is thus of halving ratios around the 16th and 17th is clear. The Lhôte scale at Hoveton is of interest in using a constant ratio, 4:7, i.e., a slightly faster halving rate than on the 16th. Most striking, however is the enormous scale used by John Mander at Kingston, a scale even larger than that used for the Hauptwerk Octave 4' at Clare College. The Kingston scales are also an exception in being the only 'rising' (R) scale form in Table VIII/11, producing very wide trebles. The similarity between the Mitchell Hall and Queen's scales are evident, confirming Peter Walker's intention to 'copy' Queen's.[243]

If the Principal 8' is taken as characterising the masculine element of a builder's style then the Gedackt 8' and Rohr Flute 8' may be similarly regarded as the female element. Taking first the Rohr Flute,

Table VIII/12

Some 8' Rohr Flute scales in ascending order of diameter

Organ	Builder	ϕ C	8ve ratio	ϕ c	8ve ratio	ϕ c'	8ve ratio	ϕ c''
Henley	Collins	105	1:1.6 5:8	65	1:1.5 2:3	43	1:1.55	28
Queen's	Frobenius	106	1:1.5 2:3	70	1:1.55	45	1:1.55	29
Clare	von Beckerath	113	1:1.45	78	1:1.45	53	1:1.45	36
Bryanston	Church/Lhôte	118	1:1.8 5:9	64	1:1.5	43	1:1.6 5:8	27.5
University Coll.Sch.	J.W. Walker	120	1:1.5	80	1:1.5	53	1:1.6 5:8	33
Keighley	Laycock & Bannister	127	1:1.4 5:7	89	1:1.63 $1:\sqrt{2^2/_3}$ ½ on 18	54	1:1.58 $1:\sqrt{2.5}$ ½ on 19	34
Clifton	Rieger	130	1:1.8 5:9	72	1:1.66 3:5	42	1:1.55	27
Christ Church	Rieger	130	1:1.8 5:9	72	1:1.66 3:5	42	1:1.55	27
Kingston	Mander	130	1:1.55	84	1:1.55	53.5	1:1.6 $1:\sqrt{2^2/_3}$ ½ on 18	33.5
Mold	Rushworth	136	1:1.5	92	1:1.66 3:5	55	1:1.35	40

Table VIII/13

Some 8' Gedackt scales in ascending order of diameter

Organ	Builder	ϕ C	8ve ratio	ϕ c	8ve ratio	ϕ c'	8ve ratio	ϕ c''
Northampton	ten Bruggencate	90x61 (83)	1:1.5	64x39 (56)	1:1.58 $1:\sqrt{2.5}$	42x23 (35)	1:1.45	28x16 (24)
Clifton	Rieger	96x70 (93)	1:1.73	55x40 (53)	1:1.66	34x24 (32)	1:1.55	22x16 (21)
Reid Hall	Ahrend	110x65 (94)	1:1.4 5:7	66	1:1.45	46	1:1.58	29
Henley	Collins	95x75 (94)	1:1.58	60x47 (60)	1:1.45	42x31 (41)	1:1.4 5:7	30x22 (29)
New College	GDB	95x76	Laukhuff Standard scale					
Clare	von Beckerath	98x74 (95)	1:1.55	64x48 (62)	1:1.5	42x32 (41)	1:1.5	27x21 (27)
Wallsend	Church/Lhôte	110x76 (98)	1:1.63	63x45 (60)	1:1.63	38x28 (37)	1:1.5	25x20 (25)
Christ Church	Rieger	100x79 (100)	1:1.4 5:7	74	1:1.63	45	1:1.58	28.5
University Coll. Sch.	J.W. Walker	120x101 (125)	1:1.45	81x70.5 (85)	1:1.45	56x48 (58)	1:1.4	40x36 (42)

Note: Dimensions of wooden pipes given first. Dimensions in brackets are conversions to diameters.

which is often found on the main manual alongside the Principal, typical base diameters are shown in Table VIII/12, giving values at each C of:

C	105 - 136 mm	(-8 to -3 HT)
c	65 - 92 mm	(-8 to 0 HT)
c'	43 - 55 mm	(-5 1/2 to 0 HT)
c''	28 - 40 mm	(-3 1/2 to +5 HT)

and with octave ratios as indicated in Table VIII/13 of:

C - c	1:1.8 to 1:1.4
c - c'	1:1.66 to 1:1.45
c' - c''	1:1.6 to 1:1.35

In the main these are rising scales centering around the 2:3 ratio and the differences in practice between the varying octave ratios are very small. Various chimney lengths and diameters are used, normally from c; 1/4 of the length and 1/4 of the diameter of the pipe are common, but they can be much longer, as at Bryanston.[244] Chimneys are usually outside the pipe.

For Gedacts, mostly of wood, and usually on the second manual, typical base dimensions are shown in Table VIII/13, with values at each C of:

C	90 x 61 mm to 120 x 101 mm	(83 to 125)	(-15 to -5 HT)
c	64 x 39 mm to 81 x 70.5 mm	(56 - 85)	(-11 1/2 to 2 HT)
c'	42 x 23 mm to 56 x 48 mm	(35 - 58)	(-4 to +1 HT)
c''	28 x 16 mm to 40 x 36 mm	(24 - 42)	(-7 to +6 HT)

A characteristic widening of the treble, as with the Rohr Flutes, is clear. Typical Octave ratios for Gedacts are:

C - c	1:1.8 to 1:1.4
c - c'	1:1.66 to 1:1.45
c' - c''	1:1.6 to 1:1.35

The ratios, or rates of diminution, lie within the same bands as those for Rohr Flutes.

The above Tables VIII/12 and 13, as also the scales given in Chapter VII, show that very varied scales are used for stopped registers. The rate of diminution is however, more consistent, centering around near constant ratios such as 5:8, 2:3 and 5:7.

Beyond this no standard pattern emerges, though the flute scales do show one or two features of interest. For example, the similar treatment of the flutes on Clifton Cathedral, Christ Church, Wallsend and Bryanston suggests the common influence of Lhôte. At Clifton, where the organ was described by Higginbottom as proclaiming in sound "a strong bias towards late 17th-century North European Schools of organ building,"[245] and where the Rohrflöte 8' was seen as not being "any substitute for a Bourdon,"[246] the Rohrflöte scale is identical with the Flûte à Cheminée 8' at Christ Church, where Glatter-Götz described the organ as French "from nomenclature to scales"![247] The scale is in fact similar to Bédos' scale for a 'narrow' Bourdon.[248] Though the scales do not tell the whole story, they do appear as an important pointer to builder style or format, one which goes far beyond stop names.

It is hardly to be expected that any unified pattern would emerge in a period of development from amongst a number of relatively isolated organs and from so diverse a selection of builders. While the organs discussed above do not represent the total of organs built, the treatment of stops does indicate that the general scaling trends in the period for flue pipes, as for principals, do conform in the main to those discussed by Andersen.[249]

The individual scaling patterns do show each builder as developing a 'preferred' pattern, i.e., for a principal base around either 135 mm ('Scandinavian'), or 155 mm ('normal', or 'French'), other registers following from this base but with the flutes showing a less regular pattern. (See individual scale sheets for particular organs in Chapter VII.) The scales do not show builders as adopting a basic format such as a constant 1: $\sqrt[4]{8}$, normal scale, in their practice; those shown appear rather to be pragmatic or empirically arrived at progressions which satisfy the ear (and possibly mind and eye), of the individual builder. They are in Andersen's words "scales of experience", the secret of which is "the organ builder himself."[250]

A new factor to enter into scaling practice in 1969[251] was the development by Richard Rensch, and the sale by Laukhuff (within the organ building trade), of the Rensch Scaling Slide Rule for Organ Pipes. With this device it became a relatively simple matter to 'read off' certain details relating to scaling, and to draw the scale on standard prepared logarithmic graph paper showing the deviation of the scale from normal measure. The advantages of such a device in the workshop for instant reading of scale values, length, diameter, mouth width, octave ratio etc., are obvious. At the same time the tendency to draw scales by eye as curves on the prepared 'Rensch' sheets cannot be ignored, even if difficult to document. This method of arriving at scales is to some extent different from the historic, classical builders whose scales were arrived at, as Andersen points out, from straight lines and basic ratios such as 1:2, 3:5 etc., with or without addition constants.[252]

Pipe Dimensions - Reeds

As Andersen writes, "reeds may be separated into two main groups: those with long, tuned resonators; and those with short, untuned resonators.... The form of the resonator, cylindrical or conical, makes a decisive difference in tonal quality."[253] To these differences must be added those of shallot form and composite resonator shape. The variables are such that the differences in practice are greater than in the case of flue stops.

In the main manual the Trumpet 8' is the long-resonator reed equivalent of the Principal 8'. Chapter VII gives details of the scales of a number of examples, which vary from a top-of-resonator diameter of 75 mm at Paddington Green to 110 mm at Clifton, Christ Church Cathedral and the Reid Hall. Again Clifton and Christ Church have identically scaled Trumpets with similar open, round-ended, parallel shallots. The Krummhorn 8' is a fairly common second-manual reed. The forms taken by stops entitled 'Krummhorn' and 'Cromorne', can vary from narrow, short-resonator regals, as at Queen's College, with a diameter of 13 mm; to half-length stops with diameters of 32 mm and 34 mm at Clifton and Christ Church, where the stops are again almost identical, there can also be differences in the construction of boot and shallot. The influence of the Queen's College Cromorne is evident in the 'copies' essayed by Peter Walker at the Mitchell Hall, and in the Grant, Degens and Bradbeer organs at Woodford and Dunchurch, scaled by ten Bruggencate. The Queen's College Cromorne was a reed the sonorities of which seemed to appeal to many, and which was also easily accessible at the front of the Brustwerk! In Pedal organs a common reed is the 16' Fagot, in wood or metal, but no general scaling patterns are evident. In the period under review reed shallots for Trumpets and Krummhorns are generally 'French' in style, open and parallel with rounded ends, the depth being variable. Fagots and Dulzians tend to have partially closed shallots.

Possibly the most significant feature of the reed stops is the strong influence of the trade suppliers, especially Giesecke, but also Laukhuff, Rogers and others. The large-scale use of imported reeds, shown in Chapter VII has, it may be suggested, inhibited the development of individual styles of reed work of English builders in the period.

Some study of the behaviour of reed stops has been undertaken for example by Phelps[254] and Rensch and Jahn,[255] but the interactions of shallot, tongue, block and resonator, together with the varying materials used in their construction, are so diverse that no formula or "definite rules"[256] can be proposed. The experience and taste of the individual builder, or supplier, appears paramount. As a "well known organ theorist," discussing resonators, and quoted by Andersen, suggested: "With an experience coefficient, the formula might have been corrected and put to some use, if it was not already so complicated that it was unsuitable for any practical purpose."[257] Again the builder, his intuition (or experience), ear, and taste seem to be the 'arcana' or 'secret'.

Voicing

The study of pipe speech has long been an area of fascination and study. Papers have been published by builders such as Walter Frobenius,[258] Rensch and Jann,[259] and Mertin,[260] and Ziegler;[261] by organ experts such as Smets,[262] Ellerhorst,[263] and Lottermoser and Meyer;[264] and by physicists and acousticians such as Mercer,[265] Nolle,[266] Fletcher[267] and many others.[268] Nevertheless, voicing remains as yet a craft matter employing hand tools, rather than a 'literate' matter, using scientific devices. Two factors are significant: the construction of the pipe and the adjustments made to it. When the flue-pipe reaches the voicer some aspects of its tonal qualities are already fixed: material, its manufacture and thickness, shape, mouth form, mouth width, languid angle and languid thickness. The variables remaining to the voicer are, mouth height ('cut-up'), foot-hole size, position of languid, position of upper and lower lip, width of flue, ears, nicking, and, to some extent, wind pressure. These variables are all interdependent.

The task of the voicer is to "produce the sound that is natural for the pipe in question, according to its construction and scale,"[269] though, as Phelps suggests, "this becomes a refining process to accommodate what the pipe does naturally to today's most cultured tastes,"[270] thus "craftsmanship and scholarship must be tempered with the good taste that is true musicianship."[271] It would seem that a voicer begins with a mental picture of the sound in his head,[272] and his skill in producing a consistent result in differing organs is the hall-mark of his style. The voicer's ears are the arbiter of the sound, though craft, skill, assistants and advisers may play their part.

Assuming an established wind pressure, the principal areas of control of timbre are the pipe foot and pipe mouth. Throughout the period under review the classical builders have broadly adhered to the practice of 'open-foot' voicing. As has been shown by experiments by

G. D. Harrison[273] and Forsyth-Grant,[274] the pressure in the foot of such a pipe is the same as that in the windchest. The voicer is thus working essentially on the pressure in the windchest. This is economic of wind and results in " better blended, better balanced and better integrated ensembles."[275] Thus, as Phelps suggested, experiment confirmed the practice of the historic classical builders.[276]

Given an open foot, cut-up appears the most important single factor influencing tonal quality: "the richness of the acoustic spectrum varies inversely as the height of the mouth"[277] or, the lower the cut-up the 'edgier' the sound, the higher the cut-up the 'flutier' the sound. After cut-up comes adjustment of the relative positions and angles of languid and pipe lips: if the languid is low, the pipes will be 'quick' and almost speaking the octave (as at Wallsend). Normally the mouth shape is rectangular but arched flute mouths were used by Peter Walker at Aberdeen. As shown in Chapter VII cut-up is normally around one-quarter for principals and one-third for flutes. The use of ears, shown in the Tables in Chapter VII, can assist in preventing loss of the fundamental. The use of flue regulation, i.e., the widening or narrowing of the gap between the languid and the lower lip of the pipe, following Zachariassen, had been the dominant voicing technique in the period. As Phelps wrote "I have regulated exclusively on the flue for more than twenty years and with every pipe I voice become more convinced that it is the only way to truly musical results."[278]

The absence of 'nicks' on languid, and sometimes lower lip, has thus been seen as indicating the adoption of the classical approach. The aim of such an approach being a "transparent, rich, singing and responsive tone."[279] Such has been the aim of builders such as Collins, Grant, Degens and Bradbeer, Church, ten Bruggencate and others mentioned in the previous Chapter. Nicking reduces the energy of the edge tones and initial transients[280] and, as Zachariassen said, "renders the tone smooth, dull, characterless and confused."[281] The lack of transients not only produces a boring sound but their absence in music, as in speech, makes for unintelligibility.[282] Expressed differently, but with similar interest was Stravinsky's remark: "The fault of the —— Symphony is that it has no attack."[283] Thus the richer the acoustic the more vital, for both organ and voice, is the need for consonants.

An organ in a small room, or a non-reverberant room, will not require the same emphasis on speech transients that is necessary in a large, reverberant room. These opening and closing transients are the 'spices' of lively tone quality[284] and an organ which over-emphasises such an element (or parts of such,[285]) may be seen as lacking in taste. Organs such as Shellingford or Clare College may not unreasonably be regarded as 'over-spiced' for their (relatively small) acoustic surroundings, whereas a similar treatment at Keighley (a large and resonant church), is far more acceptable.

The general practice of earlier builders such as Schnitger or Smith was virtually nick-free voicing, but the comment of Janke that, "nicking has always been practised, even during the "nick-free" voicing era of the last few decades. It was just not talked about,"[286] has some truth in it both historically and now. Recent classical organs in Britain show evidence of (usually light), nicking. Deep nicking (which is effectively a widening of the flue[287]), is only found in the Bishop organ in Christ the King, Reading, (see preceding Chapter). As Nolle indicated, "deep nicking cannot be used if the pipe is to be regulated effectively by the flue-closing method."[288] Inspection of old organs, such as those of Smith, also shows that the languid edges are not clean and sharp, unlike, for example, those at New College, Clifton Cathedral, Cranford or Woodford. Other recent classical organs, whilst having no nicks, have rough-edged languids. At Douai Abbey, when the organ was first voiced, Luciano Tamburini gently 'roughed-up' the languid edges with a file; at Queen's College the languids appear to have been similarly treated, and it is said that the underside of the languids on the Elizabeth Hall organ were similarly treated by Flentrop's voicer.[289] Such treatment has a similar effect to nicking in promoting a softer attack.

In the attempt to achieve a transparent, rich and singing sound, aimed at by classical builders, the question arises as to how far 'nicking' is a legitimate voicing device to assist the production of a 'natural' tone or how far it represents 'failure', or impatience, on the part of the voicer. The process of voicing without nicking does, as Zachariassen points out, require great patience coupled with good pipe construction.[290] Here may be seen the part-failure of many recent organs. As Flentrop said of Brasenose, while "the voicing is acceptable; however, it is not the kind of sound which gives the satisfaction you find in some of the finest organs... this unevenness and irregularity is partly due to the fact that Mr. Collins did not allow himself to give sufficient time to do this work correctly."[291]

The matter of pipe construction, in relation to voicing, appears a significant influence on the final result. Burney describes Smith as never wasting his time on trying to mend a bad pipe, "he instantly threw it away and made another. This, in great measure, accounts for the equality and sweetness of his stops."[292] Gottfried Silbermann is reported as saying, "My best voicer is my pipe-maker."[293] More recently ten Bruggencate has commented on the significance of both the nature and quality of pipe construction on voicing, drawing attention in particular to the difference in pipe construction between builders such as Schnitger and Silbermann and the present.[294] Whereas present practice is for planed metal to be marked out for foot and body, the foot shaped and soldered, the languid added, followed by the body and the pipe then sent to the voicer for the mouth to be cut out, the old builders scraped and planed the metal after hammering, the mouth was cut out in the flat (as at Metzlers today),[295] and, after rounding up and soldering the two sections separately, the pipe-maker then "holds the foot against the body and blows, moving the foot until he gets an air cutting noise. Holding them in this position, he solders them together."[296] Ten Bruggencate points out (from his experience at Metzler), that this method is both fast, 2 hours 3 minutes to make an Octave 2' rank, and very rapid to voice, 28 1/2 minutes.[297] Kinsela confirms that Metzler's newly made pipes speak perfectly, hardly needing the voicer's attention.[298] Experiments at J. W. Walker under Michael Butler also showed that the overall mouth form can effect the tone quality.[299] Here a series of 'identical' pipes were made up with varying mouth shapes, bay-leaf, French, triangular and others. The 'traditional' bay-leaf was considered by Butler to be easiest to voice and to give the most satisfactory tonal result.

The materials used have been discussed above but one facet of handling the metal, hammering,should be mentioned. In recent years builders such as Metzler, Ahrend, Tamburini, Freiburger Orgelbau, Schumacher and others, following Ahrend,[300] have begun to use hammering - a process shown clearly in Bédos.[301] As discussed, the effect of hammering is said to remove tension in the metal, as also to stiffen pipes with a high lead content. It is interesting that the reversion to hammering has occurred in conjunction with a move away from high tin content pipework. According to Metzler "hammering makes the voicer's task much easier."[302] According to ten Bruggencate,[303] and Tamburini[304] and Schumacher[305] hammering makes the tone "brighter and clearer", as well as warm and rich.

Voicing procedure varies, certain voicers spend a long time on 'pre-voicing' before installation in the building, others virtually none. When in the building some voicers, such as Church, work on the pipes inside the organ; others, such as Collins at Henley, direct the making of adjustments, by an assistant, from a point within the church. Discussion with, and observation of, many of the builders mentioned in Chapter VII indicate that the final cut-up is arrived at empirically on site, as are the flue width and languid position. An influence on voicing procedure has been the Rensch slide rule. Collins, for example, cuts-up the C pipes, voices them first by mouth, then on the appropriate pressure, and then adjusts them for "attack, timbre and stability": the cut-ups of the C's are then measured and the cut-up of the other pipes in the octave read from the slide rule.[306] In general however builders have written relatively little about the voicing process and the most detailed description for any organ in the period is that of Peter Walker for Aberdeen (Appendix F, 12).

Flue voicing has been discussed in some detail as it is here that the organ builder is most likely to influence the tonal character of the organ. Reeds are usually small in number, and as commented, the common practice has been to buy these in, pre-voiced, principally from Giesecke, but as Chapter VII shows, also from Killinger, Laukhuff, Stinkens and Rogers. The general trend in reed construction, from the Festival Hall onwards, has been the use of French 'O' shaped, open, parallel shallots, with rounded or angled ('beak') ends, for Trumpets and other reeds; and the use of 'tear-drop' shallots, usually with beaked ends for Fagots and Dulzians. The practice has thus become similar to the French practice (described by Mertin),[307] of employing two shallot forms;

parallel open ones for the 'bright' registers, Trumpet, Cromorne, Regal and Vox Humana, and more conical 'bassoon' shallots with a 'tear-drop' opening for the 'dark' registers, Fagot, Dulzian, Rankett. Generally speaking the pipes supplied by the trade did not indicate a specific builder style, but they have assured a basic level of quality and stability. The 'French style' whilst much discussed was not always carried through to the 'double-nut' boot construction,[308] as at the Festival Hall, (Appendix F, 3), and in the case of Trumpet 8' at Bryanston. 'Normal' German/English style boots have been common, as might be expected, in reeds from Giesecke. Some reeds, as at Queen's, have been mounted in a solid block of mahogany (Appendix E, 23) - a practice seeming to give a rich, stable sound. The various factors contributing to the tonal qualities of reeds are such that "a fundamental consideration of this entire complex could well occupy a lifetime,"[309] and analysis of individual registers would thus have limited significance. Full details of a number of reeds, e.g., Festival Hall, Clifton Cathedral, Bryanston and Christ Church, are, however, given in Appendices F and B.

Observation of the organs detailed in Chapter VII does indicate the pattern of development in voicing style on the part of the younger firms. Firstly, there is the persistent attempt to emulate the Frobenius sound at Oxford, secondly, there is an element of overstatement in the early organs, such as Shellingford and New College, resulting in an aggressive briskness. It would seem that this is a necessary stage in the arousal of interest amongst organists, and in the experience of the builder. How far English organ building has developed between organs such as Shellingford and Trent College, and Southampton and Bryanston is evident in the increasing satisfaction found in the voicing, though this is not to suggest that the 'school' has yet reached maturity. The organs also demonstrate the hand of the individual and the consistency of individual style. The effect of the individual, and his training, can be seen in the work of John Mander at Pembroke College. Despite the organ being founded upon material by Smith it might be suggested that the final tonal result is more reminiscent of the Clare College organ (on which John Mander worked whilst being trained by von Beckerath), than of other Smith material such as that at Trinity College. Equally the Metzler-derived style of ten Bruggencate was consistent and unlike the work of his contemporaries (such as Collins), despite a similarity of basic principal scale measure. As Phelps suggested, the "quality of the final result depends greatly on the quality and skill of the voicer, but nothing helps so much as having the proportions correct in the first place."[310] Observation of the organs and discussions with many of their builders similarly confirms Zachariassen's premise that voicing is not a totally independent factor, but is dependent upon scaling, pipe construction and materials, windchest construction, case resonance and room acoustic.[311] Whilst, to quote Andersen, a voicer "can make a pipe sound in many different ways.... the natural sound lies within rather narrow limits and it is the voicer's craft to find it."[312] As with action, quality of voicing depends upon the fine craftwork of individuals and, as with scaling, the secret is the individual, his experience, skill and taste.

Temperament[313]

It is now around one hundred years since equal temperament was adopted for organs in England.[314] This change did not pass unnoticed or unopposed, as indicated in W. T. Best's comments on S. S. Wesley and his "insane notion of tuning, or rather un-tuning, the instrument,"[315] or William Pole's reference, in 1879, to "the introduction of the detestable equal-temperament."[316] As Padgham and others,[317] and the New Grove Dictionary,[318] indicate, discussion of the problem of temperament has surfaced regularly and, as shown in Wolf's discussion of the graphical representation and function of historic temperaments,[319] and recent articles in Early Music,[320] it remains a matter for debate.

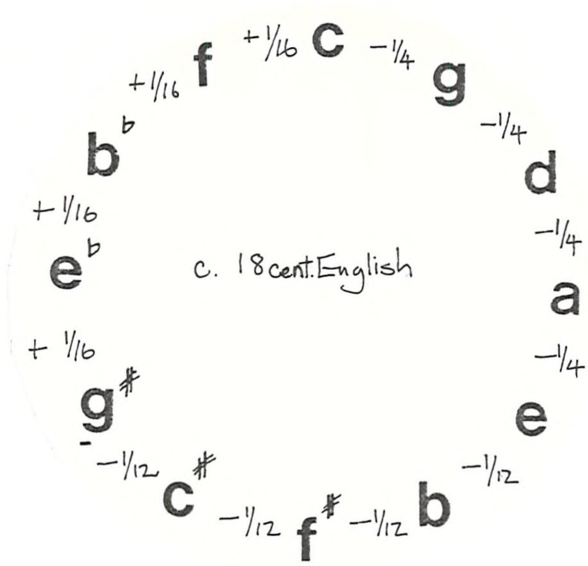
Up to the early 1970's new organs continued to be tuned in equal temperament.[321] During the 1970's there was a noticeable shift in attitude, and a significant number of new organs were tuned in temperaments other than equal. The reasons for this appear to be two-fold: a desire on the part of musicians for 'authenticity',[322] and a desire on the part of organ builders to achieve better blend in the revived mixture and mutation series.[323] (It is interesting to note that "there was a noticeable dislike of mixture stops towards the end of the 19th century in England after equal temperament was introduced."[324]

The earliest 'new' classical organ to employ an un-equal temperament[325] was at Eton where the Mittenreiter/Flentrop organ was tuned in Werckmeister III.[326]

Source: Klop, 1974, p. 19.

This temperament has since been used extensively e.g., Metzler, Trinity College, (1976); Renshaw, Upper Hadres (1976); Collins, Manchester University (1976), and Paddington Green (1978); Church, Wallsend (1978), Hoveton (1978), Beverley (1979), and Bryanston (1980).

In 1974 William Drake tuned the new Buckfastleigh Centre organ in a modified 'temperament ordinaire' or '18th century English temperament.[327]

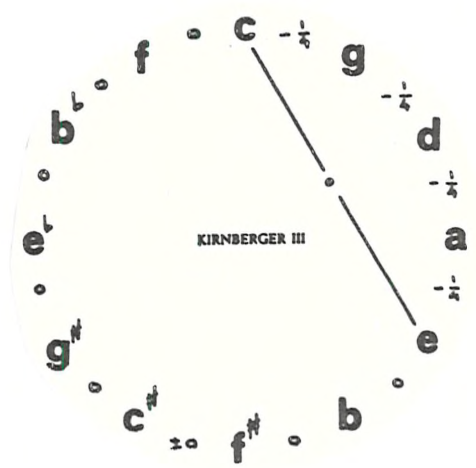


Source: W. Drake, Buckfastleigh.

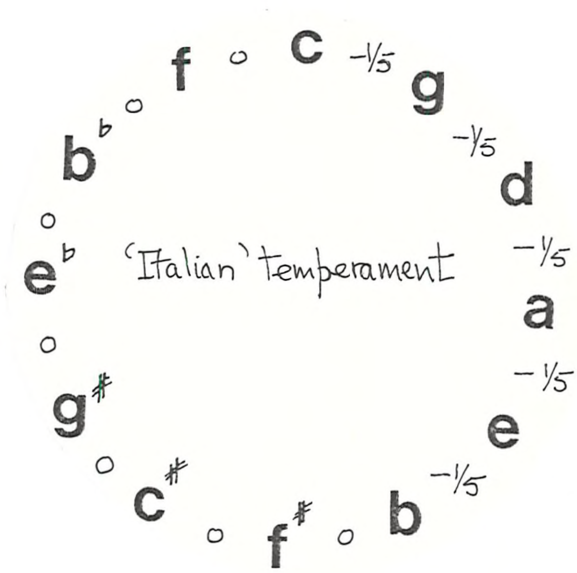
The pace quickened in 1977 with the introduction of three other unequal temperaments; van Biezen[328] at Sydenham and Mellor, and later, in 1978, in the Christian Science Church at Edinburgh.

Source: Klop, G.C., 1974, p. 27.

Kirnberger III[329] was used by Freiburger Orgelbau at Douai (School Chapel), Marlow, Morden and Roehampton in 1977, and in the following year at Blackheath Roman Catholic Church. At Dorridge Roman Catholic Church and St. James', Reading, Tamburini employed an old Italian temperament, derived from the practice of Tuscan organ builders in the 18th and 19th centuries.[330] Similar temperaments were also used by Tamburini in Douai Abbey Church (1978), and St. Hugh's College, Oxford (1979). As Klop suggests[331] such Italian temperaments are very akin to Kirnberger III.

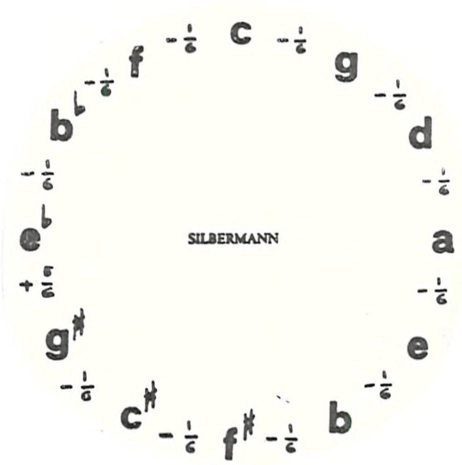


Source: Klop. G.C., 1974, p. 23.



Source: Luciano Tamburini 1977.

In 1978 three more temperaments appeared: at Edinburgh Ahrend employed Werckmeister II;[332] an unspecified temperament of his own devising was used by John Mander at Chelsea,[333] and at Kingston on the Hill he used a 'Silbermann', one-sixth- comma meantone tuning.[334]



Source: Klop, G.C. 1974, p.16.

At the same time equal temperament has been employed in a number of significant organs: e.g., by Collins at Henley, Southampton University and Dorchester; in all organs by Church up to 1978; by Walker at Romford, Streatham and University College School; by Rieger at Christ Church; and Frobenius at Stoke d'Abernon, and Robinson College.

Though attention has been focussed in recent years on the matter of temperament, it cannot be considered in isolation. With insecure and unmusical voicing temperament counts for little, and may even make a poor ensemble worse. On the other hand given good voicing then the enhancement of blend, as in the Cornet at Eton, is very evident. In practical terms the most commonly used temperaments, Werckmeister, Kirnberger, van Biezen, as also the Italian temperaments, all have a large number of pure fifths and are relatively easy to tune. The quarter-comma meantone temperament and the 'temperament ordinaire', are almost as difficult to tune as equal temperament. The maintenance of a large number of differing tunings may also present problems in the longer term.

Some curious decisions have been made with regard to tuning: why, for example, is the Collins organ at Paddington Green, a so-called 'English' organ, in Werckmeister III? A similar question might be asked with regard to the Smith/Metzler organ in Trinity College. Equally strange has been the decision, in 1982, to change the temperament of The Queen's College organ from equal temperament to an unequal one of James Dalton's devising. In this latter instance voicing originally aligned to equal temperament now appears to have lost some of its cohesion and blend, as well as losing its tuning stability, which had previously been a matter of common remark.[335]

In 1979 Charles Padgham, in collaboration with Peter Collins and Geoffrey Parker, reported an experiment[336] to determine listeners' preferences with regard to five temperaments, 1/4 and 1/5 common meantone, '18th century English', and Werckmeister III and equal. A preference emerged for the 18th century English temperament, followed by Werckmeister III and equal temperament. The suggestion was made by Padgham and his colleagues that "meantone temperaments are not acceptable to modern ears."[337] Though the experiment was carefully structured it might, however, be suggested that, leaving aside the matter of musical context and registration, the effect of retuning the same stops to differing temperaments affects not just tuning but also pipe speech and that the listeners' judgements could have been affected by this, as much as by temperament.

Compound Stops

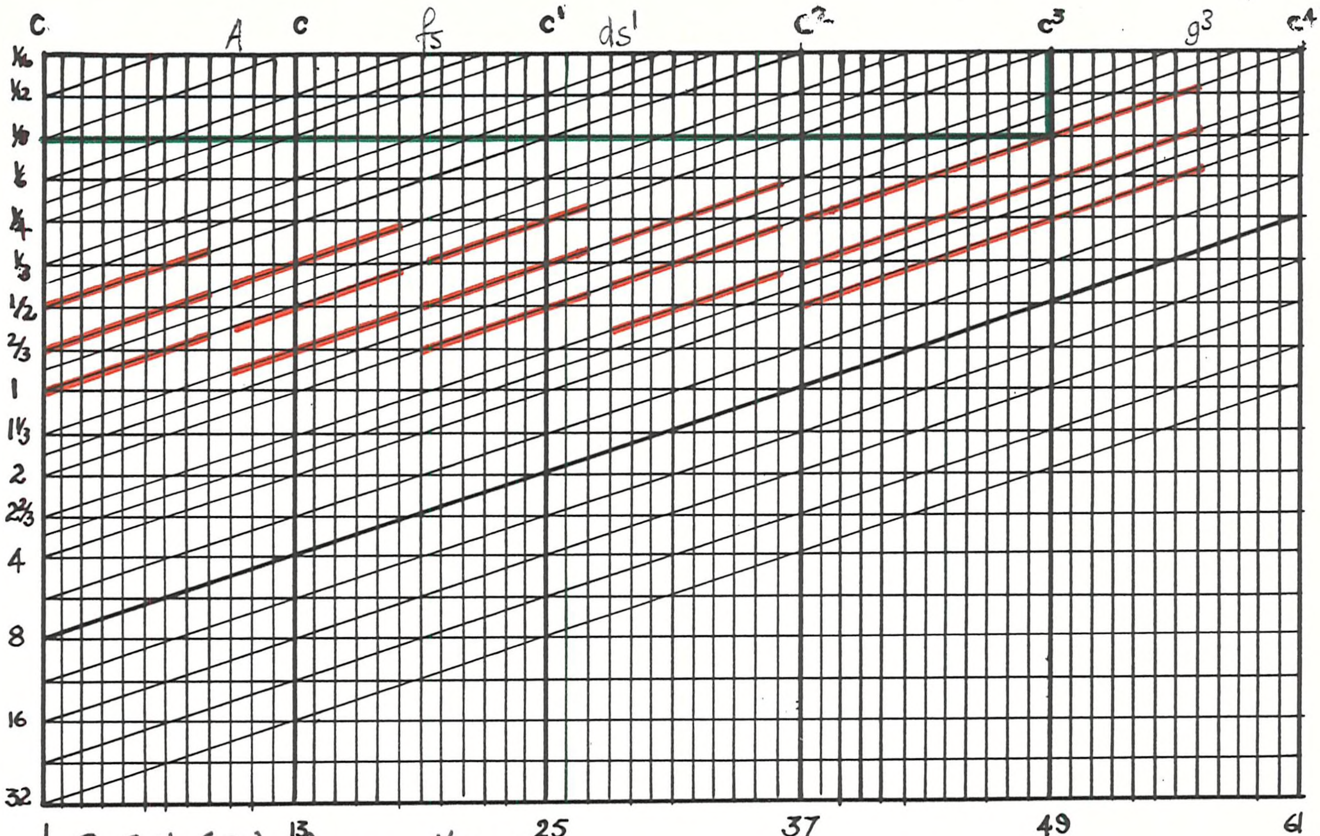
The function of compound stops, mutations and mixtures, is to colour the chorus, or foundation stops, in use. Mutations, e.g., Nazard and Tierce, "serve chiefly the purpose of strongly characterising the aural effect of the fundamental voice. For this reason, mutation voices find their pure application in the area of solo registrations,"[338] i.e., they are an enrichment of the colour of the wide-scale registers. Mixtures "serve as the ultimate superstructure of the Principal choirs,"[339] their function is to "enlarge, enrich and cement together into a cohesive entity the foundation Principal voices."[340] Traditionally mixtures are seen as adding "clarity to the bass, fullness to the middle, and gravity to the treble."[341] Whereas mutations tend towards blend and absorption into the foundation stops, mixtures tend towards 'enlargement' or 'eminence' giving power and brilliance, though, as Williams[342] points out, the French Plein Jeu, (and the Fourniture/Cymbale of Gottfried Silbermann), could be seen essentially as just another 'colour' of the organ, as for example was the Grand Jeu.

In considering the structure of mixtures "the formulation of general rules is difficult."[343] One broad change however has clearly followed upon the installation of the Festival Hall organ: the 'traditional' three-rank Mixture (1 3/5', 1 1/3', 1' or 2', 1 1/3', 1'), common for a long time in England, has largely been abandoned.[344] The Festival Hall organ, with its many compound stops, focussed attention on a wider range of mixtures and mutations and, as shown in Chapter V, organs in the Downes/Harrison/Walker pattern placed much emphasis on these registers.

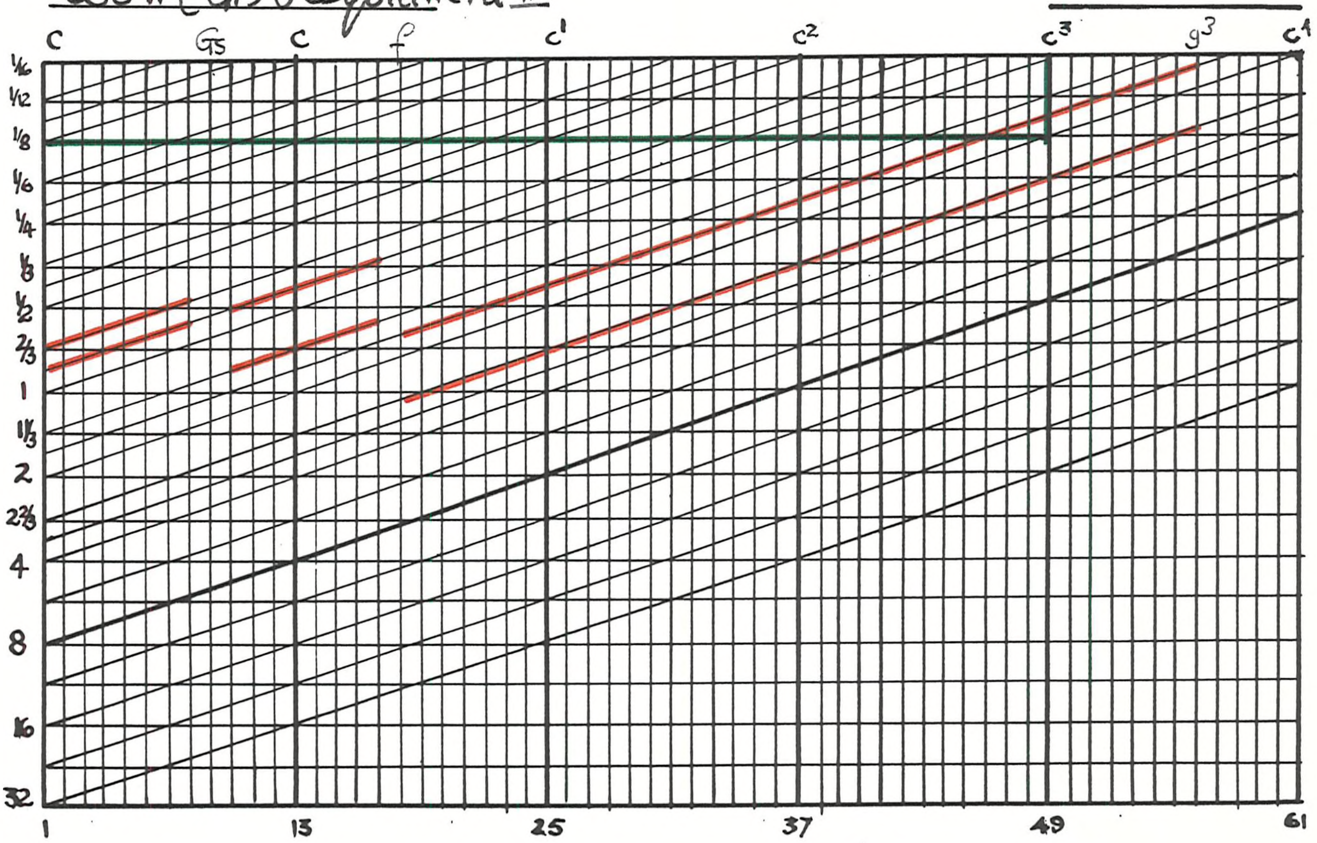
In analysing mixtures on organs of the classical revival, certain of these are shown here in graphical form (Table VIII/14 and Appendix C), a method used by Thomas Stevens[345] and, according to Stevens, originating from Jean Fellot in his research into the history of the Plein Jeu.[346] A similar graphical form has also been employed by Klais.[347] Such a graph enables the speaking lengths of the various ranks, their relation to the unison line, their breaks, doublings and ceilings to be read off simultaneously. It also shows the extent to which a compound stop behaves in 'musical' terms, whether melodically, or otherwise.

QEH(Gt) Mixture III

Table VIII/14



QEH(Gt) Sesquialtera II



Note: The red lines denote the progression of the ranks of the compound registers throughout the compass. The green line indicates the limit of the French "Plein Jeu", in which "no rank is higher than 3' pitch at c''' " (Williams, P. 1980(1), p.107).

Since the installation of the Queen's College organ, mixtures have fallen into three main groups: Mixtures, Scharffs, and Zimbels: Mixtures tend to have three or four ranks or more, are of moderate scale, and commence at a relatively low pitch, 2 2/3', 1 1/3' or 1': very often 1 1/3'. They are generally 'dynamic', or upward-moving, in progression, consist of unisons and quints, and may have doubled ranks present, e.g., Queen's College, New College, Clifton Cathedral, Reid Hall, and Mold (Appendix C, 2-6). Scharffs commence at a higher pitch than Mixtures, 1' - 1/2', and are of narrower scale. They are generally a little more static in upward progression, consist of unisons and quints, and doubled ranks may be present, e.g., Queen's College, New College, Clifton Cathedral, and Reid Hall (Appendix C, 2-5). Zimbels (Cimbels) tend to be very high pitched, commencing from 2/3' to 1/3', though most often from the 1/2'. They have very many breaks, relatively few ranks (as few as one at Aberdeen (Appendix C, 7)), and show no doubling. Historically Zimbels have employed both quints and thirds, as well as unisons, but recent examples on classical organs in England have almost all been 'quint-cimbels', e.g., Aberdeen (Appendix C, 7), Clifton Cathedral (Appendix C, 3-6), Lancaster (Appendix C, 8). A notable exception was the Mollterzimbel (1/2', 8/19', 1/3'), used at York by Grant, Degens and Bradbeer, and later changed to a quint-Zimbel. It is also noticeable that the Aberdeen Cimbel is effectively a 1' stop for the central part of its compass.

Almost all the Mixtures of the classical revival in England are quint Mixtures and, in general, they employ fifth repetition, or breaking back.[348] The older octave repetition[349] is however found on the organs by Bishop, at Grays and Reading, both of which derive from Schnitger's Nieuw Scheemda organ. Octave repetition is also used on The Queen's College (Appendix C, 2), Huddersfield Polytechnic (Appendix C, 9b) and Reid Hall organs in the tenor region of the Scharff Mixtures - the reason for this might be seen as the wish to lower the pitch ceiling early in the middle and upper regions of the compass.

Builders are by no means always consistent in their mixture, or compound stop, nomenclature. On organs such as Queen's College, New College, Clifton Cathedral and Mold the nomenclature is precise and accurate, e.g., the New College Rückpositiv Scharffzimbel (Appendix C, 3a) is correctly named - it is a relatively high, fairly static quint-mixture. On other organs the nomenclature is more confused, e.g., the Zimbels at Shellingford and Woodford (Appendix C, 10b) are dynamic Scharffs, or, at Christ Church (Appendix C, 11a, b), Rieger has named both the Hauptwerk second mixture and Rückpositiv mixture, 'Cymbale'. In reality only the Hauptwerk stop is a relatively static 'French' Cymbale, the Rückpositiv Cymbale being a normal Scharff.

An unusual Mixture, of II-IV ranks, in which lower ranks are added to each 'c' (used by Collins at Cranford - Appendix C, 12 - and in later organs), has been criticised by Russill as causing serious imbalance to the chorus, being lacking in bass and overburdened in the treble.[350] The graph in Appendix C, 12, shows clearly that such a stop is strongly melodic in character, similar to a Cornet or Sesquialtera, and lacking in the 'anti-melodic' structure of a true chorus mixture e.g., those by Schnitger (Appendix C, 13), Bédos (Appendix C, 14), or Ahrend (Appendix C, 5). The reason for Russill's criticism thus becomes clear.

No consistent pattern emerges for mixture breaks. The main function of the break is to control the pitch ceiling, to keep sounds within the audible limit, and to keep pipes within the practical limits of size.[351] Andersen suggests the highest practical pitch is around 1200-1300 cycles, allowing the 1' rank to run through to g'''.[352] This ceiling, in excess of the 1/16' level, is however, much higher than the limits seen in historic organs - suggested by Stevens[353] as between 1/6' and 1/8'; or Williams in terms of Bédos "no rank is higher than 2' pitch at c'''."[354] Stevens draws attention to the contrast in pitch ceilings between the historic French and German organs and the more recent 'neo-baroque' instruments, which he indicates have relatively high pitch ceilings. This is to some extent a function of compass, since most 17th- and 18th-century organs went to around c''', while contemporary organs go to g''', or even, as at Christ Church, to c''''. Even so the contrast between the Schnitger mixture, given in Andersen, or those of Ahrend at the Reid Hall; and the mixtures of organs such as Huddersfield Polytechnic, Shellingford, or Woodford, which have pipes of 1/16', or shorter, at c''', is made clear in the graphs in Appendix C. Even at Queen's College the 1/12' pipe falls on c'''. Stevens' hypothesis would thus seem to be confirmed.

The maintenance of a relatively low pitch ceiling around 1/8' and 1/12' at c''' is related not just to the number and spacing of breaks, but also to the doubling of ranks. Such doubling is often seen as a response to the need to increase the output on the treble to cope with the absorptive effect of large resonant churches.[355] This study suggests that the use of doubled ranks is at least as much, if not more, a characteristic of builder style. The use of doubled ranks is very evident in the organs associated with Lhôte, Rieger, Ahrend, and Church (and it may be recalled that Lhôte and Ahrend worked together at Taizé), as well as in instruments by Wood (Appendix C, 9a), Mander (Appendix C, 17), Flentrop, at Doetinchem (Appendix C, 15a b), and von Beckerath at Clare (Appendix C, 16). Doubled ranks are not present in the work of Collins; Grant, Degens and Bradbeer; ten Bruggencate; Thurlow; and J. W. Walker. The 'neo-classical' electric action organs of Downes/Harrison and Walker also show little use of doubling. There would appear to be no connection between the use of doubled ranks and size of building, e.g., doubled ranks are used in the Lhôte/Church organ in the tiny, not especially resonant, Bryanston Church. It might therefore be suggested that doubling is both a matter of maintaining a low pitch ceiling, and of giving a desired 'colour' to the chorus. In this context it should also be recalled that doubled ranks were characteristic of Schnitger,[356] the Silbermanns and the classical French builders.[357] At a more mundane level the use of a meagre number of ranks may be due to a low budget.

Unlike mixtures, mutations follow straightforward rules. Classical mutations consist of ranks sounding at 5 1/3', 3 1/5', 2 2/3', 2', 1 3/5', 1 1/3' and 1' pitch but, following post-War German practice, other pitches, e.g., 1 1/7' (b'); 8/9' (d''); 16/19 (ds''); have been used. The latter, with the exception of the None 8/9' at Shellingford, (later changed to a 1') were exclusively employed by Grant, Degens and Bradbeer at New College and York University. These later mutation forms have never really caught on, any more than has the music of Bornefeld, David and other post-War German composers for the organ.[358] The 5 1/3' also has only been used by Grant, Degens and Bradbeer, in the Pedal Mixtur, 5 1/3', 3 1/5', 2 2/7', 1 1/7' at York; this is really a Pedal 'Cornet' intended to "add great depth to the Pedal,"[359] which has no Principal 16', and is of little use other than in full organ. The use of the Terz 4/5', by Collins in two house organs,[360] appears due principally to limited space on the windchest.

The function of classical mutations is twofold: to blend and give a colourful melodic line in association with the foundation stops, or in the case of the Cornet, to enrich the <u>Grands Jeux</u>, as also to strengthen reed trebles. The 'melodic' character of such registers is shown by the New College Cornet (Appendix C, 3b), in which it is seen that the progression is not broken within the limits of the melodic range, nor does the number of ranks change. Compared with mixtures the number of mutation ranks employed is relatively small, usually one to three, though a <u>Jeu de Tierce</u> can have from the usual eight or nine (including foundation pitches), to thirteen listed by Bedos for a <u>Grand Jeu de Tierce</u>, 32!'[361] Whereas mixtures are of normal to narrow-scale open pipes, mutations are of normal- to wide-scale, and may be of open, partially-open or stopped pipes.

Mutations may be disposed singly or in groups. The two common groups are Sesquialtera (2 2/3' + 1 3/5'), Cornet (2 2/3', 2', 1 3/5'), with or without the 8' and 4' foundation flutes. Cornets and Sesquialteras are usually placed in physically dominant positions on <u>Hauptwerk</u> or <u>Rückpositiv</u>, though Cornets, whether drawn collectively or as separate ranks, do appear on Swell divisions and, where there is no <u>Rückpositiv</u>, the Sesquialtera may be placed in the <u>Brustwerk</u>. Relatively narrow scaled Sesquialteras, are found in the Reid Hall, Clifton Cathedral organs, and wider scale Cornets at New College, Hexham, Eton, Woodford, Christ Church. Occasionally the Sesquialtera has one or two breaks in the bottom octave, a disposition to some extent arising from shortage of space on the windchest, as at Christ the King, Reading, (where it was copied from the Brompton Oratory - Flentrop - organ). In every instance, from the Queen Elizabeth Hall organ onwards, the employment of such a Sesquialtera can be linked with the influence of Downes, e.g., Lancaster. Downes' reasons for preferring this arrangement are not clear, and he does not discuss the matter at all in <u>Baroque Tricks</u>. Sesquialteras can also be split into their separate ranks, giving at Shellingford narrow-scaled Nazard and

Tierce; or at Bryanston a wider scale Nazard and Tierce. Often the wider scales are employed, e.g., at Bryanston and Nottingham, alongside the main Trumpet 8'. Such a procedure gives a wide range of melodic colour, as well as the possibility of a Grand Jeu combination. The Tertian, used by Downes at the Festival Hall, Oratory, and later found in other organs where he advised, is not found in any of the mechanical-action organs, but the separate 1 3/5' and 1 1/3' pitches are found together on the same manual at New College, The Royal Northern College, St. Andrew's, and Hexham. It would thus appear that the Tertian became something of a 'luxury' stop in more recent years. The other unison and fifth sounding mutations, Flute 2', Larigot 1 1/3' and Sifflute 1' are usually found as constituents of a subsidiary chorus, e.g., in the Echo at Bryanston, but occasionally the Flute 2' is found alongside a Principal 2', e.g., at Dorchester, and Trinity College, in the main or subsidiary manual.

Mechanical Action

Before discussing particular aspects of recent actions, in view of the centrality of mechanical action to classical organs some general issues should be mentioned. The process of playing a mechanical-action organ, discussed by Kern and Glatter-Götz,[362] and also Phelps,[363] and confirmed by examination of many organs, may be summarised as:

1. The finger touches the key. Here the key covering must give warmth and security to the skin, which is a very sensitive organ.
2. Increasing muscular strength is applied until the wind pressure on the pallet is felt and overcome.
3. The 'break-point', at which the wind pressure is overcome, and the pipe speech is initiated is precisely felt. The speed at which the pallet opens, and wind enters the pipe, depends upon key speed. As this is varied so the onset of pipe speech is varied. The nature of the 'breakthrough' gives a sensation indicating the character of the onset of speech, i.e., gives physical feedback.
4. After the wind pressure is overcome, the holding strength is reduced as the wind pressure on the pallet lessens to that of suction and pallet spring pressure.

5. The return of the pallet on release of the key is by the pallet spring. The finger senses the increasing wind suction and attack of the wind pressure. Through the speed of the key the decay of speech can be controlled, as can the onset of speech.

The organist thus functions via sensation, directly influencing the sound envelope and obtaining accurate feedback. The behaviour required is thus that of both keyboard player and wind player. It is essential that the playing mechanism convey the onset, growth, continuance and cessation of pipe speech accurately to the player. For these sensations to be conveyed accurately there must be no break in the chain from pallet to person, nor must the mass of material to be moved, or the tensions and pressures overcome, be beyond easy muscular control, thus inhibiting the musical intent of the player. Further, if the ear is to confirm these sensations as they occur, the sound source must be no more than some six metres from the player, and the sound must reach the player directly. Here is the physiological reason for shallow case depth and vertical disposition.

The work required from the player is related to: use of wind, pressure of wind, spring tension, action mass, and movement. Hence the importance of controlling wind leakage from the chest and the need for smooth channels and borings to avoid friction and turbulence. The pipe speaks on pressure in the foot: thus open-foot voicing, where the pipe speaks on minimum wind pressure, reduces the need for high wind pressure at the pallet,[364] and results in a light action. The pallet spring carries both pallet and action, and must be strong enough to close promptly and tightly. Spring tension can thus be reduced by well fitting pallets and lightweight action parts. As many writers such as Zachariassen,[365] Collins,[366] and Church[367] have shown, pallets should be long and thin to allow maximum wind into the bar for minimum movement.

The action- key, roller, square, tracker, pallet etc - has a mass which must be moved and accelerated by the finger. The faster the movement required the greater the energy needed; mass and movement need, therefore, to be minimised. Momentum, or movement, is lost if trackers are bent or slack, play is present in joints, by torsion in rollers, bending in roller arms, by the use of compressible materials (bushings), and by insufficient rigidity in square- or backfall-beams, rollerboard frames, key-frames, or even the overall organ-frame construction. Rigidity and lightness are thus critical components of a good action. The maintenance of tension in the action, without allowing the pallet to open, is a fundamental problem. False movement, or inadequate tension, as Herbert Norman suggests, gives "a spongy and indefinite increase in touch weight in the first 3 mm of depression of the key."[368] Many ways of maintaining tension, thumper rails, floating beams and pneumatic, hydraulic or spring damping, are described by Norman in his article, "Tracker Action Key Touch" but, surprisingly, he ignores the 'key-tensioned' or 'suspended' action. This is, however, discussed by Legros[369] and Church.[370]

Power to move the action mass and make contact with the pallet and wind may be lost through friction in joints or guides. The greater the friction present, the more the pallet spring tension must be increased. Resistance is felt at the key and the pressure point and breakpoint are obliterated because the spring tension becomes greater than the wind pressure. The result is a heavy and spongy touch. Felt Bushing reduces action noise but can also result in excess friction and, by its compressible nature, make for a spongy touch. Nylon bushing is firmer but is suceptible to temperature change, and can also cause the touch to be affected adversely.

Considering the importance of mechanical action is it surprising that so little has been written on the subject. Often though, for commercial reasons, builders are reluctant to describe their working process in detail. Possibly the most significant study recently has been that by Legros, mentioned above, in which he examined the functioning of the 1782 Clicquot organ at Souvigny.[371]

Since the 1950's organ actions in England have, small positives excepted, been of two types: centre-pivoted, or tail-pivoted. The centre pivoted, 'backfall', actions have followed the pattern established in the 1930's and 1940's by Marcussen[372] seen in the Gruntvig Church (see Appendix D, 1, 2) or, as used by Frobenius, at the Queen's College (Appendix D, 13, 14). These actions have a 'floating beam' which maintains a constant depth of touch regardless of changes in temperature and humidity.[373] The backfall beam, or, as at Queen's, double square beam, is 'hung' and, may be tensioned by a variety of devices; its own weight (Queen's); additional weights (a piece of brick on a string at Cranford!); pneumatic motors (Clifton Cathedral, Clare College, Douai Old Church); by hydraulic ('Kinetrol') dampers (Servite Priory, New College, and other Grant, Degens and Bradbeer organs, as also at Keighley). A sophisticated version, employing springs, was used by Rieger at Christ Church, where the beam is hung from the windchest, thus lessening the possibility of movement.[374] As Church[375] points out, the floating beam action does have (unlike the older (19th century) English 'sticker and backfall', chamber organ action), three, or four, pivot points, the key, the backfall (or double squares), and the roller. When well set up, floating-beam actions (as at Queen's or Christ Church), can as indicated later in this Chapter, "produce an excellent touch."[376] If, however, the action is not accurately set up, problems, shown so clearly at Brasenose (see Chapter VII), can arise.

Tail-pivoted actions, referred to by Schumacher, as "the ideal type of construction for today,"[377] have a long history going back at least to organs such as Oosthuizen (C.1530),[378] and St. Petronio (1474).[379] Many later historic Dutch and French organs used this action, referred to as 'suspendu', including organs such as Souvigny (1782) where "the lightness and precision of the touch never fails to astound organ builders and organists alike."[380] Until the late 1970's centre-pivoted actions were the norm in England. In 1977 and 1978 a number of tail-pivoted actions were built in England by:

Tamburini	Dorridge RC Church
	Reading, St. James' RC Church (Appendix D, 73)
	Thatcham RC Church
	Douai Abbey (Appendix D, 79)
	Mill Hill RC Church
Ahrend	Reid Hall (Appendix D, 82)
Freiburger Orgelbau	Blackheath RC Church
Church	Wallsend RC Church (Appendix D, 85)
Mander	Kingston-on-the-Hill RC Church (Appendix D, 74, 75)

The attraction of this action form was so strong that at Kingston it was used by John Mander for an organ on the gallery rail where the keys were higher than the windchest! Normally, however, the tracker is attached to near the centre of the key and goes vertically to the roller board and then to the pallet. The action is thus suspended from the pallet. The key may rest on the pivot as at Edinburgh (Appendix D, 82), or be sprung upward against the pivot point as at Bryanston (Appendix D, 104). As the Ahrend organ demonstrates, the action is indeed simple and has just two pivot points. The action run could not be more direct and is economic in use of materials.

The directness of suspended action does present certain restrictions upon layout, e.g., unless double squares are introduced the pallets must be at the front of the windchest. If the divisions are disposed vertically the trackers of the lower keyboard(s) must pass through the keys of the upper keyboard(s). Stability of the long wooden keys is therefore critical and, at Reading, Tamburini used wood-faced aluminium channel in the key construction to obviate movement of the wood. In turn console layout is determined within specific limits, and the pedal board usually needs to be nearer the front of the organ case than is usual in Britain (see Kingston drawing, Appendix D, 73, 74). On the Reid Hall organ the pedal board is actually on the front of the case (Appendix D, 82). Tail-pivoted actions also impose certain restrictions on the placing of the couplers, which need to be in close proximity to the vertical alignment of the trackers and to the keys. At Edinburgh Ahrend disposed of this matter by providing only a shift coupler for Rückpositiv to Hauptwerk and a Hauptwerk to Pedal coupler, an arrangement presenting, as the drawing (Appendix D, 82) shows, no mechanical or spatial problems, and resulting in an action described by Clutton as "superlative."[381]

Turning to the matter of coupler action, these in general have been of the 'backfall' type,[382] and centred in a beam.[383] In the middle of the 1970's builders such as Collins (Henley) and Church (Coxwold), used centre-less backfalls. These, as at Henley (Appendix E, 32, 33), pivoted over a bar which could be raised and lowered to engage and disengage the coupler. They proved difficult to set up, and were later abandoned. As the two volumes of The Classical Organ in Britain show, the provision of couplers is now limited in general to inter-manual and manual to pedal couplers, an exception, as mentioned being the Reid Hall organ.

The materials of tracker actions have passed through a similar pattern of development to that of windchests. In England the mass of nineteenth-century actions was considerable. In order to reduce this mass, actions by builders such as Collins and Grant, Degens and Bradbeer, as in earlier compromise organs by Mander and Walker, used 'new' materials, aluminium for rollers, squares, pallets, tracker wires; thin steel wire for trackers; and plastic for squares. This process was encouraged by the sale of prepared parts by Laukhuff and other trade suppliers. The English builders thus followed the German practice of assembling actions from parts, rather than the Scandinavian practice of building actions. The wooden action of Frobenius at Queen's seemingly passed un-noticed - except for being disparaged by Phelps.[384] Ten Bruggencate, though working on a small scale, also used wood for his actions (Appendix E, 21, 22). Slowly, during the mid-1970's, the use of the 'new' materials fell away. At the Royal School of Church Music in 1975 Collins used wooden pallets. The next year, at Henley, Collins' action, other than rollers, was made largely wood. The 1978 Ahrend organ, however, as also the Kingston organ by Mander, had an all-wooden action. This trend has since continued to develop. The trade suppliers such as Laukhuff have now moved over to making wooden parts, and "wooden actions are again to be seen in abundance."[385] The reasons for this appear to be twofold: as Collins points out, wood is "both light and strong,"[386] also wood is easily obtainable, and "the builder has the tools readily at hand to fashion the medium without any sophisticated and expensive tooling."[387] It also allows "the builder to be in control of as many parts of the instrument as possible."[388] This is a matter of both artistic and financial importance. Another example of reversion to traditional materials has been the use of small diameter (c. 3-4 mm), iron rollers by Tamburini, following a tradition going back to the 1474 St. Petronio organ. Such rollers occupy very little space, reduce the space required for the rollerboard, are relatively light, and not markedly affected by torsion.

The leverages used within the action (to assist in moving the pallet), vary between builders; 1:1 as at Mold is common. At Hexham leverage is utilised to greater advantage, the action having a leverage of 10:3 at the key,[389] thus reducing the travel of the action; this is then re-levered up near the pallet, at the roller board, using long

Table VIII/15

Manual Key Touch Weights All stops drawn; in gms

		C	c	c'	c''
Doetinchem (Flentrop, 1952)	HW(9)	250+	175	175	175
	RP(9)	210	165	150	140
	BW(7)	200	150	125	120
Queen's College (Frobenius, 1965)	GT(8)	200	184	150	150
	SW(7)	170	155	120	115
Woodley (ten Bruggencate, 1970)	MAN(5)	125	115	85	85
Clifton Cathedral (Rieger, 1973)	HW(7)	90	80	80	65
	RP(7)	80	70	60	60
	BW(7)	60	50	50	50
Hexham (Phelps, 1974)	GT(10)	255	226	184	155
	SW(14)	212	171	155	141
Henley (Collins, 1976)	GT(7)	200	200	150	150
	RP(6)	200	150	150	135
Trinity College (Metzler, 1976)	HW(12)	227	198	212	-
	RP(10)	171	141	127	-
	SW(11)	198	198	198	-
Douai Abbey (Tamburini, 1978)	MAN(8)	160	160	150	140
Wallsend (Church/Lhôte, 1979)	GT(5)	90	85	85	85
	CH(5)	80	80	75	75
Christ Church (Rieger, 1979)	HW(11)	160	160	150	120
	RP(9)	140	125	125	120
	SW(11)	165	125	100	80
	BOM(3)	140	140	160	130
Bryanston School (Church/Lhôte, 1980)	GT(9)	140	125	100	80
	EC(6)	135	100	90	75

Notes: (1) The number in brackets, e.g., HW(9), is the number of stops on that manual.

(2) Clare College, New College and Brasenose College were regarded as having heavier touches than Queen's College, Trinity College and Hexham.

(3) Queen's College, Hexham and Trinity College, were measured by W. Johnson; Clifton Cathedral by A. Cawston; the remainder by the writer.

and short roller arms. The resulting action gives a rather deep touch, has very little tolerance of movement, and thus requires a very stable frame. It does, however, reduce the inertia of the action considerably and hence gives a light touch. A further means of lightening the touch was tried at Hexham in the form of 'split' pallets. These were made in two sections, the crossways cut was leathered over as a hinge, and the break-through of the wind pressure was thus in two stages. There were, however, problems with ciphering, and they were taken out around 1975 by Phelp's assistant, Clive Webster.[390] Squares with unequal arm lengths have also been used by Phelps and Marcussen to adjust leverages. At Nottingham Marcussen used squares with several attachment holes to allow the fine tuning of the action on site.[391] Leverage has also been employed by Hradetzky, at Manchester, to give an almost constant touch weight throughout the keyboard compass.[392] The value of this is however questionable, since the player might reasonably expect a different touch from large bass notes to small treble ones.

The touch weights of a number of organs are summarised in Table VIII/15.

Even allowing for the differing size of instrument, manuals, and scales, certain differences are striking: the remarkably light touch achieved by Rieger at Clifton Cathedral; by Lhôte/Church at Wallsend and Bryanston; and by ten Bruggencate at Woodley; and by Tamburini at Douai is noteworthy, as is the fact that the Lhôte/Church and Tamburini organs have suspended action. (Experience of the Ahrend organ suggests that its touch is as light as any of the above organs). Weight of touch is however not all: 'quality' of touch, however difficult to define, is important. In an attempt to obtain some information as to what is meant by 'quality of touch' a questionnaire was prepared (Appendix F, 21), and sent to a selected number of professional organ recitalists, advisers, and builders. It was devised to encompass a representative group of organs with discernibly different touches, a fair number of which might have been experienced by most of those to whom the questionnaire was sent.

Thirty-two questionnaires were sent out, twenty-two to players, including three of international stature; three to advisers, and seven to builders.

Fourteen were returned, of which eleven were completed to varying degrees. Of those completed, five were from performers (including the three players of considerable distinction), two from advisers, (one of whom had been an organ builder), and two from organ builders. Although the number of questionnaires returned was small, the professional stature of those who responded was such as to warrant an attempt at some assessment of the responses. No respondent had played all the organs listed, nor was it possible to obtain comments from them all for any one organ. Comparative or numerical analysis was therefore not possible.

Nevertheless, by inspection of all the returned questionnaires it is possible to make one or two general comments about touch in relation to ten organs. In brief the Queen's, Hexham, Trinity, and Christ Church organs were seen as having "excellent" qualities of touch (though one player and one adviser dissented over Trinity), Clare, Clifton Cathedral, St. Mary's Nottingham and the Royal Northern College of Music organs were seen as "good"; the Turner Sims Concert Hall as "satisfactory"; and New College, as "poor". In general "excellent" or "good" touch was shown as "light", "crisp", "responsive", and creating a feeling of "oneness" between player and organ; "satisfactory" and "poor" touch was described in terms of "spongy" and "unresponsive".

Perhaps as interesting as the responses regarding the specific organs listed were some of the comments made as a result of the questionnaire. Several of those replying commented on the problem of making objective statements due, on the one hand to having played the different instruments at widely differing times, and on the other to extraneous factors, personal, acoustic and tonal etc.. (It was also noticeable that certain responses showed a personal preference for those organs, or builders, with which they had been associated in some way or other!). One player felt unable to complete the questionnaire because he considered that there could be no <u>one</u> good touch for all the repertoire. In terms of touch weight, two players indicated that from around 118 gms to 226 gms was acceptable. These suggested 'acceptable' touch weights, are confirmed by the responses to the questionnaire, which show performers as rating highly the touch on the Queen's, Trinity and Hexham organs, which, as shown in Table VIII/15 have touch weights in these regions. By contrast the two organ builders suggested that a touch around 70 - 100 gms was to be preferred. It might however be suggested that this liking for a relatively heavy touch on the part of the players is due to its allowing more latitude to the travelling performer. One player suggested that the "spring-tension is very important - if too heavy one has to <u>hold</u> down the keys - responsiveness at the top can be negated (subjectively <u>and</u> objectively because of what is played <u>next</u>) by this. 'Crispness' is pleasant but can hide the fact that the key isn't actually <u>controlling</u> the wind (e.g. Fisk at Harvard - subjective feeling of good action but in fact useless)." Other respondents noted that problems of excessive key weight can arise when manuals are coupled. A comment made by one adviser that "British builders seem to have managed pretty good general purpose actions... but have not yet reached the precision of, say Frobenius, at Queen's College," is borne out by the replies to the questionnaire. It is also perhaps worth noting that one English builder "took a defensive line", and declined to fill in the questionnaire. A very telling comment by one player was that the skill and craftsmanship of the builder was the most critical factor in any organ action, a matter borne out by inspection of many organs.

The response to the questionnaire shows the need for further carefully controlled research in the area of organ touch - possibly a detailed investigation of the characteristics of both 'good' and 'poor' actions - along the lines of Legros' study at Souvigny.

Stop and Combination Action

Both practice and opinion have been divided over the form of stop and combination action. To some extent, however, it appears a function of size; no new classical organ of under eighteen stops has employed other than mechanical stop action. Between 1965 and 1980 some thirty-seven classical organs have been built with over eighteen stops. Of these twelve had mechanical stop action, twenty-four electrical or electropneumatic stop action and one, Christ Church, used a dual mechanical and electrical system.

In terms of design Zachariassen pointed out that in a small or medium sized organ, or even a large organ, the mechanism of a non-mechanical stop action (through the space it occupies) can "give rise to a deterioration in the disposition of the organ."[393] The virtues of mechanical stop action have been clearly shown by Hans Haselböck:[394] it is cheap, reliable, fast, quiet and durable. Discussion with many builders and players throughout the course of this study confirms these viewpoints; there did not appear to be a single instance of a problem-free non-mechanical stop action.

A particular problem is that of noise on drawing or returning a stop, or stops, a matter very noticeable when the stops are built into a case made deliberately resonant for musical reasons. Careful hand registration reduces impact noise to almost zero at the on- or off-point of the stop, but the force used to set a stop in motion electrically is dissipated at the on- or off-point, producing noise. Normally this noise can only be reduced by slowing up the movement of the stop and, in turn, the speed of registration change. The only instance where impact noise problems have been overcome is at Christ Church, where each solenoid has two coils, one to set the stop in motion, the other to provide a brake to reduce the force at which the stop comes to rest, a system first used by Rieger in the 1960's (Düsseldorf, Neanderkirche, 1964; München, Christuskirche, 1968).

Electric stop action (as shown in both Volumes of <u>The Classical Organ in Britain</u>) is never used for its own sake, but always in conjunction with a combination action. The use of combination actions stems from the wish to make rapid registrational changes because of either musical or liturgical 'need', on organs with relatively large numbers of stops. Such a wish is not a new one, or even an invention of the nineteenth century; it has been in existence since at least the Italian organs of the 16th century.[395] Since electric stop action, whether because of its aesthetic disharmony, unreliability, or noisiness, had not won universal approval[396] the 1970's saw growing discussion of the development of mechanical combination actions.[397] No example of such a system has been employed in England prior to 1980, though the 1967 Flentrop organ in the Queen Elizabeth Hall had six mechanical composition pedals (rather as did nineteenth-century English organs), and Metzler, in 1976 at Trinity College, provided two combination pedals, one for <u>Organo Pleno</u> on <u>Hauptwerk</u> and Pedal, the other to control the Pedal reeds.

Console

The style and detail of consoles by various builders are shown in the working drawings in Appendix D, in the photographs in the two Volumes of The Classical Organ in Britain, and in Appendix E. There are, however, a few details about which comment should be made. One very dramatic change brought about by the classical revival is the almost total disappearance of that 'prestigious' object, the 'detached console'. Consoles are now integral parts of the organ structure, though some (for example those by Wood at Huddersfield Polytechnic, and Mander, St. John's, Chelsea[398]) still give the appearance of being 'tacked-on'. The only detached console on a recent classical organ in Britain is that on the Hradetzky organ at St. Andrew's. It is also exceptional in having the stops in horizontal rows on terraced jambs, in a style reminiscent of Cavaillé-Coll.[399] In most instances the stops are placed at right angles to the case on either side of the keyboards, but, where electric stop action is used, there is a tendency to have angled jambs. The old-style arrangement of Ahrend at the Reid Hall, where the stop knobs are placed in the rear of the Rückpositiv case has been commented on in Chapter VII. The early classical revival native instruments tended to have standard stop knobs from Heuss or Laukhuff but, as the younger builders developed their own building style, so details such as stop knobs began to show a personal touch, such as Collins' stop knobs from Cranford onwards, which appear to be derived from those of the 1958 Ahrend organ at Bremen-Farge;[400] (which are themselves 'Marcussen-derivative') Church from Sandiacre onwards; or Walker's who reverted to the nineteenth-century Walker style with its engraved script writing. Builders such as Frobenius and Marcussen used their 'normal' style when building in Britain.

The stop layout is usually in terms of pitch, the reeds placed above the flues. At the Queen's College, however, the layout follows the chest layout, making for a simple and logical stop action layout. No attempt has been made to adopt an arrangement such as that proposed by Rensch,[401] where the stops are laid out in groups of principals, flutes, reeds, strings, and accessories; nor has there been any attempt at coding by colour, or material, though the organs by Tamburini at Thatcham, Dorridge and Douai place the flutes separately from the

Ripieno, as in the old Italian organs (e.g., Thatcham, Bordone 8'; Ripieno 4', XV, XIX, XXII; Flauto 4'). Tamburini also uses old style stop levers rather than draw-stops.[402]

Another change associated with the classical revival is that of compass. The 61/32 note, C-c'''', manual, and C-g' pedal compass has become 56/30 note, C-g''' and C-f' in all but a few cases, e.g., Pembroke College, and Christ Church. At Pembroke College manual compass has a 'broken octave' A,G g''', and at Christ Church, Oxford, C-c''''. The size of keys has also changed. Whilst the use of bought-in keyboards from Laukhuff, and Monnington and Weston, has been common, there has been a tendency for keys to become shorter and narrower, and more akin to those of earlier periods, as seen in organs by Ahrend and Tamburini. The reason for this appears to stem from interest in the stylistic performance of music of earlier periods, coupled with a reaction against the large 'piano-style' keyboards common until the 1960's. Up until then ivory, or ivory substitutes were the norm for organ key coverings. During the 1960's and 70's a variety of key coverings have been used including ivory (Frobenius), grenadil (Church), rosewood (Collins), box (Tamburini) and satinwood (Mander) for naturals; and, for sharps, ebony (Tamburini), box (Bishops), and rosewood (Collins) these latter inlaid with an ivothene or sycamore strip, in Snetzler fashion. Whilst overhanging keyboards remain usual, organs such as Paddington Green and the Reid Hall have no overhang.

There has also been a radical change in pedalboard design. The C-g', 'Royal College of Organists', radiating-and-concave pedal board has ceased to be standard, though is still the most usual shape. At Clifton the American AGO concave-and-radiating board was used. The parallel and concave contemporary 'German' style board has been used by a variety of builders, both native and otherwise, and the straight and flat 'Schnitger' style board has been used by Ahrend. The advantages of the parallel board are those of simple mechanical construction to the builder and consistency of key spacing for the player. As discussed earlier a factor affecting console layout is that of action run: where, for example, suspended action is used, then there are limits on the position of both key-boards and music desk, relative to the chests and case. The simple arrangement of placing the pedal board on the front of the case, as at Edinburgh, has repercussions on the relationship between manuals and pedals, and upon playing posture and style.[403] A new pedal board, said to combine the advantages of the radiating- and-concave pedal board with those of the parallel board, has been devised by Kenneth Jones and was used at Glenstal Abbey in 1981.[404] Such a pedal board has not yet been used in Britain.

Architecture

Since Gothic times organs have been built with free-standing cases which surround and house the pipes. The case has the dual function of blending and focussing the organ's sound. As Sumner has pointed out:

> "The great organ builders of the past realised that the whole structure of the instrument was capable of forced vibration and sound transmission. The worthy, liberally planned and well-joined woodwork of the instruments, apart from the pipes, contributed not a little to the success of the organ," 405

as well as protecting the pipes and mechanism.[406] These functions were however lost sight of by the beginning of the twentieth-century. As discussed in Chapter III, the return of the organ case, first seen in the Gruntvigskirke, Copenhagen in 1940,[407] heralded the classical revival proper. It was the first in a continuing line of encased classical organs. Though the outward appearance of an organ is important (organs are seen for far longer than they are heard), organ architecture is not just concerned with appearances, but with matters of mechanical and acoustic logic, the outward form being an expression of inner function, indeed the classical organ may be defined as one in which there is an "intimate coherence between aural and visual architecture."[408] The prospect is the most obvious element of this outward form and may thus be taken as expressing the intention of the builder.

Despite developments in Europe in the first half of the twentieth-century, it was possible for Blanton to write, in 1957, that "the modern organ case is practically non-existent in America and England,"[409] an accurate reflection on a time which saw the organ in St. Bride's, Fleet Street (1953), being entombed in its concrete chambers. It was not until some forty years after the building of the Gruntvigskirke organ, that Clutton and Niland were able to write: "In the 1980's a situation has been reached in Britain which twenty years ago seemed virtually unthinkable: no organ builder worthy of the name today would make an instrument without casework of considered design, or at least careful consideration of its external appearance."[410]

The process of development in England was fitful: The Holtkamp style Festival Hall organ brought speaking pipes into view again but resulted in architects indulging, as in the Cathedrals of Coventry and Liverpool (Roman Catholic), in misguided 'functionalism'.[411] Certain of the neo-classical electric action organs did have cases. Though some were largely decorative screens, e.g., Corpus Christi, Osmondthorpe (Appendix E, 19); others were more functional, e.g., St. John's, Islington (Appendix E, 17); St. Martin, Hull (Appendix D, 8, 9, 10). Stylistically they included pastiche at All Hallow's[412] and St. Clement Danes (Appendix D, 5, 6, 7); 'contemporary' neo-Germanic 'box' cases at Sussex University,[413] Millbrook (Appendix D, 11) and Fairfield Hall;[414] and 'Scandinavian' inspired prospects at Dunster[415] and St. Martin's Hull, the former with a Marcussen-style Trumpet <u>en-chamade</u> the latter with asymmetric casework (Appendix D, 8) reminiscent of Frobenius.

With the building of the organs by Marcussen and Frobenius in the Finnish and Danish Seamen's Churches and the Queen's College, further change was set in motion, a change accelerated by the experiences of builders, such as Forsyth-Grant and Collins,[416] and players, such as Lumsden and Butterworth,[417] who encountered encased organs throughout Europe. By the early- to mid-1970's a variety of prospects, reflecting these experiences, were to be seen in England.

Historically prospects have been of a few basic forms, reflective of internal layout:

i) a chromatic layout with a key-scale windchest, e.g., portative and table organs, giving one 'division' of pipes

ii) an 'N' chest, with a key-scale arrangement for most of the compass, but with bass notes 'stood off' alternately at either end, with rollers for the bass pipes, e.g., Noorlanda,[418] giving an asymmetrical tri-partite division in prospect, albeit within an overall rectangular shape

iii) a symmetrical layout, e.g., Sion,[419] Malmö,[420] or Oosthuizen,[421] where rollerboards are used to transmit the whole action to the chest. Such an arrangement can produce three divisions of pipes, as at Sion, but more often five, and seven or more in larger organs. Symmetrical layouts divide into those with a 'strong' centre, i.e., a high central tower; or 'weak', lower, centre with higher side towers. A variant of this is the old Italian prospect, e.g., Bologna,[422] where the towered form is placed within a rectangle and the rectangular form emphasized by the use of large, high, intervening flats. A similar example is found at Old Radnor.[423]

Historically prospects are either flat, as in the case of the old Italian organ, or have pointed, round, or half-hexagonal towers.

Contemporary prospects in Europe have employed both the historic symmetrical forms, e.g., the van Vulpen organ in St. Eusebiuskerk, Arnhem;[424] the Rieger organ in Ulm Cathedral;[425] or the Grossmünster;[426] as well as consciously asymmetric approach, e.g., the Rieger nave organ in Freiburg Dom[427] and the Klais organ at Oberursel.[428]

All of these forms have been used in recent years in Britain: the simple chromatic prospect by Grant, Degens and Bradbeer at Hull and elsewhere:[429] the 'N'-chest format at Marlow.[430] The symmetrical three division prospect is exemplified by ten Bruggencate at Besford Court[431] or Tamburini at St. Hugh's College, Oxford.[432] Five-division prospects are common from Queen's College[433] onwards, and include organs with a strong central element (derived from historic precedents at Osthuizen and Kiedrich), such as Wallsend[434] and Bryanston (Appendix D, 97). Organs with a weak central element are seen at the Reid Hall[435] Stoke d'Abernon.[436] Organs with particularly weak central elements, by Walker at Romford,[437] and by Marcussen at Nottingham Clifton[438] (the centre of this latter degenerating into a few vertical slats) are both prospects designed in conjunction with architects, David Graebe and George Pace respectively.

Flat rectangular prospects are exemplified by the organs at Cranford,[439] Southampton University,[440] and Woodford.[441] Flat towered cases are seen at New College,[442] Keighley,[443] and Henley.[444]

Various tower forms have been employed: e.g., rounded towers at Queen's College[445] and Paddington Green;[446] pointed towers at Blackheath Roman Catholic Church[447] and Finchley.[448] A number of organs, Northampton Cathedral,[449] Wallsend[450] and Bryanston (Appendix D, 97), follow the Kiedrich pattern,[451] (later used by Metzler, e.g., St. Alban's, Basel (Appendix E, 36)), of a part-hexagonal centre tower with two, or three pipes at the 'point'. Organs with towers do indicate, on the whole, a more consciously 'historical' attitude, and a trend towards the use of towered forms is very evident from an inspection of the two volumes of The Classical Organ in Britain: over twice as many organs in Volume Two use towered forms as in the first Volume. That this trend is a continuing one is shown by the organs detailed in the latter part of Chapter VII. Most of the towered cases are not style copies, though a small number, e.g., Haverfordwest,[452] St. Hugh's College, Oxford,[453] and St. Anne's, Caversham[454] have a clearly identifiable historic basis.

Non-symmetrical prospects tend to fall into two groups: those with pipe groupings giving a sloping case roof line, e.g., Chalfont,[455] Thatcham,[456] and Dundee.[457] This form is generally seen in small, one-chest, organs in relatively small rooms. Larger asymmetric forms arise from the placement of the different manual and pedal divisions; e.g., the Royal Northern College Concert Hall organ.[458] These asymmetric forms tend to derive from their architectural surroundings. At the Royal Northern College the organ stands 'off-centre' in a non-symmetrical concert hall. At Thatcham[459] and Dorridge[460] an off-centre position, coupled with sloping church roof lines, determined the prospect form.

The influence of architecture on the organ form is most clearly seen at Clifton Cathedral, where the total derivation of the organ is from the hexagonal module of the Cathedral floor plan. As commented in Chapter VII not only is the asymmetry of the Cathedral reflected in the organ, but also the triangular architectural details of the ceiling and reflected in the case details. The balance between architectural influences and the technical demands of the organ is a delicate one. Whilst the Clifton organ is a dramatic sculpture well related to the Cathedral, the over-dominance of the hexagonal form is not entirely to the technical advantage of the organ. The Brustwerk and Pedal chest space is too cramped, as is the console area; and the Rückpositiv case is too large, having excessive volume, and needing some Gedact pipes to fill up the prospect (Appendix D, 55).

The treatment of case detail varies from the unadorned e.g., Clare College,[461] to the use of mouldings and carvings, e.g., Queen's College.[462] This difference in treatment has been maintained throughout the period, though there is seen a steady move away from the unadorned Orgelbewegung box to more ornamented casework. The acoustic importance of such 'ornament' is suggested by Flentrop, who is of the opinion that the intricate shapes of mouldings helps to diffuse the organ sound into all parts of a building.[463] Two details of ornamental significance are pipe mouth lines and pipe shades. Mouth lines either follow the precedent of Kiedrich, and are horizontal, e.g., Clare College,[464] Douai Abbey,[465] Bryanston (Appendix D, 97); or move at an angle, e.g., Queen's College[466] or Reid Hall.[467] The extent to which pipe mouth lines can strengthen or weaken a prospect is clear by a comparison of the King's Hall, Newcastle upon Tyne and Lancaster University organs,[468] with the organs in Henley and Northampton Cathedral.[469] The mouth shape chosen can also be influential; the 'French mouth', used by Collins at Dundee[470] or Southampton University,[471] gives rise to amusing, or playful, perspective patterns, which enliven the prospects.

The area above the pipes may have pipe shades placed behind the pipes, a treatment which emphasises the pipe length progression. Such shades are generally recessive in treatment, as in the case of the Marcussen-derived[472] shades at Southampton, though at Marlow[473] a collage has been superimposed over a neutral background. Shades may also be of the old 'engrailed', Italian style, as at Henley[474] where the shades follow the tops of the pipes. The inevitable asymmetry of this effect can give a prospect much charm. Alternatively the shades can cover the pipe tops, e.g., Queen's College[475] or Northampton Cathedral,[476] in which case the interplay between the pipe mouth lines and shades becomes of considerable significance. The ratio of solid to void in pipe shades for optimum acoustic results was given by Glatter-Götz[477] as 2:1. Flentrop is similarly convinced that pipe shades are not just decoration, but that they assist in the blend and diffusion of the sound of the organ, helping to prevent concentration on higher frequencies by distributing them more evenly, and that irregularity of shapes within the shades prevents them from emphasising particular overtones.[478] In general pipe shades greatly enhance a prospect, giving the eye a surface to play over - their absence in the Mander organ at Sydenham[479] gives rise to an incomplete appearance. Some case forms, however, do not lend themselves readily to the employment of pipe shades, especially the Frobenius style prospects at the Danish Seamen's Church,[480] Chalfont[481] or Thatcham.[482] Frobenius is one of several builders who do not attach great significance to the presence of pipe shades unless the organ case style demands it.[483]

A traditional detail seen on a number of organs (e.g., Finnish Seamen's Church,[484] Finchley,[485] Burgess Hill,[486] and the Reid Hall,[487] is shutters, or 'wings'. At Finchley the primary reason for the provision of these was the age-old one of protecting the organ, in this instance in a church kept open during the day. In other cases they are more a decorative, and tonally reflective, element giving the cases a feeling of lightness. Another element contributing to this feeling of 'lightness' is the narrowing of the case below the impost level, as in Gothic organs. This shape is a clear expression of the functional elements of an organ since such cases follow the windchest placement and action run.

The majority of cases are finished in natural timber but, there are a few painted cases, such as Stoke d'Abernon,[488] and Paddington Green.[489] Other forms of decoration are found; gilded pipe mouths at Finchley[490] and at Trinity College,[491] and embossed pipes (a tradition going back in England to the organs at Old Radnor, Tewkesbury, and Stratford on Avon), are seen on organs by Tamburini at Reading[492] and Thatcham,[493] and by Bruggencate at Haverfordwest.[494] The embossed centre pipe at Haverfordwest is in fact a dummy, used to gain case height in a tiny organ. Dummy pipes are clearly contrary to the classical ethos, and it is therefore all the more remarkable that Frobenius at Queen's placed a single mute pipe on each pedal tower. They do create a strong visual link between the main and pedal cases.

The placing of windows in a building can prove very inhibiting to organ architecture. Few church authorities and architects will accept the solution adopted by Müller in the Grote Kerk, Haarlem,[495] more often the organ is forced into subservience. In instances such as Worksop[496] or Romford,[497] the repercussions on the case are considerable.

Two particular problems of prospect are evident in recent organs in England: the placing of a 16' Pedal Bourdon in relation to a small organ with a 2' or 4' principal basis; and the Swell organ. The treatment of the Pedal 16' on small organs has varied from hiding it horizontally in the gallery at Haverfordwest,[498] to placing it in prospect at Woodley.[499] At Marlow[500] it is placed unencased behind the organ. The encasement of a single 16' Bourdon is not only expensive, but can give rise to a large bulk in relation to a small main case, e.g., Poulton-le-Fylde.[501] A Swell organ, when of any size beyond that of a small Brustwerk, can prove very disruptive to a prospect as is all too clearly shown at Hucknall,[502] where the large doors open to expose a gaping cavern; Shorncliffe,[503] where the vast expanse of shutters eclipses both the Great and the console; Huddersfield,[504] where the Great and Oberwerk prospects are perched above a row of vertical slats 'hiding' the shutters; or Christ Church Cathedral, (Appendix D, 93) where the size of the Swell forces the Great too high, and where the delicate carving in front of the Swell appears too insubstantial to support the main case.

As has been shown in Chapter VII, specific influences upon the organ architecture of the younger generation of English builders are clear. From Cranford onwards Collins was clearly influenced by Scandinavian practice; ten Bruggencate by Metzler; and Forsyth-Grant and Frank Bradbeer by the Germanic reformed builders. Nigel Church has as yet developed no personal style, his cases showing in each instance the influence of particular advisers or architects and, as yet, there are insufficient organs by Walker to betray a clearly defined style.

A considerable influence on case design has been the publication of books such as The Organ in Church Design[505] and The Revival of the Organ Case,[506] Organs of our Time,[507] The Organ Stoplist,[508] Orgeln in der Gegenwart,[509] Orgler 1970-75,[510] The Classical Organ in Britain (1975 and 1979),[511] and the issues of ISO-Information from 1969 onwards. All of these books were profusely illustrated, none more so than Blanton's Revival of the Organ Case, copies of which were and are, to be found in most organ builders' workshops. The impact of the high quality colour photographs in ISO-Information is also a factor which should not be overlooked. A problem, however, with pictures is that they are two-dimensional, whereas an organ is three-dimensional - a sculpture - seen in reality from all, or most sides. Here can be seen, in another way, why the Queen's College organ is so successful architecturally - it is as sculptural a form as is the Clifton Cathedral organ - and why the Clare College organ - with its 'drawing-board' prospect - fails architecturally.

Another influence on case design has been that of architects such as Frank Bradbeer, David Graebe, George Pace and Bruce Allsopp, and Roger Pulham, though it must be said that nowhere, as yet, has there been seen in England the creative co-operation between organ builder and architect to be found in Denmark, except to some extent in the relationship between Forsyth-Grant and Bradbeer. The beneficial influence of a sympathetic architect can however be seen by comparing the Mander organ at Mellor,[512] where the case is poorly detailed and sits uneasily in its surroundings, with the same builder's organ in St. John's, Chelsea.[513] Here a virtually identical prospect was given a character of its own and brought into harmony with its surroundings through good detailing by the church architect.

Although by 1980 it was possible for Clutton and Niland to indicate the re-acceptance in Britain of the organ case, the quality of organ architecture has been variable. Williams' comment about the organs in the first Volume of The Classical Organ in Britain, "that it is the casework that is the least attractive part of them,"[514] has truth in it, as had Downes' strictures on the Nottingham St. Mary's case by

Marcussen.[515] Equally some cases, such as those at Haverfordwest and Glasgow by ten Bruggencate; Clifton Cathedral by Rieger; and Queen's College, are generally recognised as 'distinguished' or simply as "the best."[516] These apart, since 1976 a fair number of organs, as discussed in Chapter VII, have shown awareness of good case design; that in the Reid Hall presumably satisfies Williams; and Clutton and Niland, in The British Organ (1982), draw attention to the good qualities of the Winlaton, Henley, Wallsend, Paddington Green, and University College School cases.[517] Nevertheless, it might be said that practically no problems of case design have emerged that were not implicitly solved whether in traditional or modern terms, by Frobenius in the Queen's College and Danish Seamen's Church organs. It is perhaps interesting that these organs show not only "intimate coherence between aural and visual architecture",[518] but also equal coherence between organ architecture and room architecture - and this without the organs losing their totality as sculptural objects of furniture (or architecture).

Costs

The figures in Tables VIII/16 (a) (b) (c) give the costs for a number of significant organs built since 1950. From such a group of organs it would be unwise to generalize about costs, but a number of observations may be made. A particular difficulty is finding a satisfactory basis for comparison of costs - comparison is always between unlikes, between organs of differing date, contract form, down payment, delivery time, size and disposition. Traditionally a 'per stop' cost has been used and, though crude, it perhaps serves to exemplify one or two matters. In this light some builders, e.g., Frobenius, Mander, Phelps, Peter Walker and Rushworth appear relatively highly priced, others such as Collins, Grant, Degens and Bradbeer, and ten Bruggencate seem relatively inexpensive. It is also clear that casual comparison of organs can be misleading and unfair: Shellingford may be seen as not being of such 'good quality' as the Queen Elizabeth Hall organ. The Collins organ was, however, built for little more than one third the cost, in relative terms, of the Flentrop. Quality is not solely influenced by cost, however, as is shown by the widely differing but

Table VIII/16 a, b, c

(a) Some costs for electric/electropneumatic organs

Organ	Date	Builder	Number of stops and manuals	Estimated Cost	Est. cost per stop	Final Cost	Final cost per stop	Reference
RFH	1954	Harrison	103(4)	c.£51,000	£495	c.£60,000	£582	521
Brompton Oratory	1954	J.W. Walker	45(3)			£12,980	£288	522
St Clement Danes	1958	Harrison	37(3)			£20,000	£540	523
Coventry Cathedral	1962	Harrison	73(4)			c.£35,000	£479	524
Millbrook	1966	GDB	12(2)	£3,000	£250	£3,000	£250	525
Liverpool Met. Cathedral	1967	J.W. Walker	88(4)			c.£35,000	£397	526

(b) The cost of a 'compromise classical' organ

Organ	Date	Builder	Number of stops and manuals	Estimated Cost	Est. cost per stop	Final Cost	Final cost per stop	Reference
Clifton, All Saints	1967	J.W. Walker	39(3)			£16,000	£410	527

(c) Some costs for mechanical-action, encased organs

Organ	Date	Builder	Number of stops and manuals	Estimated Cost	Est. cost per stop	Final Cost	Final cost per stop	Reference
Queen's College	1965	Frobenius	22(2)			£12,500	£568	528
Queen Elizabeth Hall	1967	Flentrop	14(2)			c.£9,000	£642	529
Royal College of Music	1967	Harrison	13(2)			£6,250	£480	530
Shellingford	1968	Collins	20(2)			£5,350	£267	531
New College	1969	G.D.B	48(3)			£23,699	£493	532
		Estimates						
		Casavant	39(3)	£28,700	£717			533
		Flentrop	32(3)	£21,200	£662			534
		Mander	32(3)	£21,130	£660			535
		Harrison	41(3)	£24,000	£585			536
		Collins	41(3)	£19,400	£468			537
		HNB	40(3)	£18,550	£463			538
		J.W. Walker	36(3)	£16,189	£449			539
Woodley	1970	ten Bruggencate	6(1)			£1,150	£191	540
Clare College	1971	von Beckerath	22(2)	£17,475	£794			541
Mitchell Hall	1972	R.H. Walker	19(2)	£13,382	£704	£17,227	£906	542
Woodford	1972	GDB	32(3)			c.£20,000	£625	543
Dunchurch	1972	GDB	14(2)	c.£5,000	£357			544

contd.

Table VIII/16c

(c) contd. Some costs for mechanical-action, encased organs

Organ	Date	Builder	Number of stops and manuals	Estimated cost	Est. cost per stop	Final Cost	Final cost per stop	Reference
Brasenose	1973	Collins	21(3)	£12,000	£571	c.£15,000	£714	545
Mold	1973	Rushworth	18(2)			£16,000	£888	546
Clifton Cathedral	1973	Rieger	26(3)	£18,000	£692	£18,000	£692	547
Nottingham, St Mary	1973	Marcussen	25(2)			£20,200	£808	548
Nottingham, Clifton	1974	Marcussen	11(2)	£6,900	£627	£14,070	£1279	549
Haverfordwest	1974	ten Bruggencate	6(1)	£2,650	£441			550
Ealing Abbey	1974	Rushworth	26(2)	£29,585	£1,137			551
Keighley	1974	Laycock & Bannister	11(2)	£7,250	£659	£8,068	£733	552
Hexham	1974	Phelps	34(2)			£33,000	£970	553
Henley	1976	Collins	16(2)			£9,642	£602	554
Northampton Cathedral	1976	ten Bruggencate	10(2)	£8,750	£875	£10,177	£1,017	555
Trinity College	1976	Metzler	42(3)	£28,000	£666	c.£80,000	£1,904	556
		Estimates						
		Mander	47(3)	£48,670	£1,037			
		Frobenius	40(3)	£40,000	£1,000			
		Harrison	45(3)	£42,300	£940			
		Ahrend & Bronzema	39(3)	£31,000	£791			
		von Beckerath	37(3)	£27,126	£733			
		Marcussen	41(3)	£29,000	£722			
Southampton University	1977	Collins	28(3)	£25,000	£893	£33,000	£1178	557
Sandiacre	1977	Church	10(2)			£14,493	£1449	558
Reading, St James'	1977	Tamburini	10(2)	£10,000	£1000			559
Blackheath	1978	Freiburger Ob	12(2)	£12,030	£1000			560
Kingston	1978	Mander	5(1)	£7,990	£1,598			561
Coxwold	1978	Church	8(2)			£11,280	£1410	562
Finchley	1978	ten Bruggencate	7(2)	£7,700	£1,100	£8,220	£1,174	563
Wallsend	1979	Church	13(2)	£14,749	£1,134	c.£18,000	£1,384	564
Christ Church	1979	Rieger	43(3)	£160,000	£3,720			565
Bryanston	1980	Church	23(2)			c.£32,000	£1,391	566
University Coll. Sch.	1980	J.W. Walker	23(2)			£62,000	£2,695	567
Reading, Christ the King	1980	Bishop	9(2)			£11,000	£1,222	568
Reading, St Anne	1980	Freiburger Ob	8(1)	£11,417	£1,427	£12,352	£1,543	569
Fenham, St Robert	1980	Harrison	13(2)			£28,000	£2,153	570
Robinson College	1980	Frobenius	26(2)	£65,000	£2500	c.£80,000	£3,076	571

well received, yet relatively inexpensive, organs at Woodley, Haverfordwest, Clifton Cathedral and, currency fluctuation apart, Trinity College. As the comments by Peter Walker regarding Aberdeen and Forsyth-Grant in the preceeding chapter show, the final amount paid for any one organ may not reflect its actual cost. The extent of such differences is unlikely to be ascertained in many instances.

Nevertheless costs have been a significant factor in the classical revival. Not only were organists excited and impressed by the new classical organs encountered in Europe in the 'sixties and 'seventies but, by the early 'seventies, it was clear that a fine tracker organ could be imported into England at a lower cost than a comparable organ could be bought from relatively inexperienced firms in England - many of which also lacked conviction in terms of classicism. This was a situation virtually identical to that in America in the late 'fifties.[519] The figures in Table V/III/(c) for 1973 demonstrate this point clearly: the Marcussen organ for St. Mary's, Nottingham cost relatively less than Mold or Brasenose. The same trend is shown again in 1976 in the estimates for Trinity College: not only Metzler, but also Ahrend and Brunzema, von Beckerath and Marcussen were less expensive than Mander and Harrison, and Mander was even marginally more expensive than Frobenius. Over the period as a whole, if the inflation rate and changes in relative currency values are taken into account, it is perhaps only native conservatism, especially within the established church, that kept imports down to around 20% of the total organs built in the 1970's.[520]

Working Drawings

In conjunction with the scales in Chapters III, V, VI and VII, the drawings relating to some thirty-six organs in Appendix D constitute a significant amount of detailed information regarding organs of the classical revival. The collection of drawings is inevitably less than complete for all the organs. The drawings for the early mechanical organs, e.g., Grundvigskirke and Shellingford are sketchy, if only because many details were worked out in the shop as building proceeded. Also many builders, such as Collins or Frobenius, often make a small-scale prospect drawing and then produce full size drawings of particular parts, such as the chest or console areas; these are then used in the workshop and, by the time the organ is built, have virtually disintegrated. In the case of the Collins organ at Henley only the prospect drawing now remains! Another factor preventing the presentation of complete working drawings is the reluctance of some builders to give access to all, or even some, of the drawings, practically all of which are kept within builders' workshops.

As well as giving fundamental technical detail such as prospect, action run, chest layout, and even scaling, the drawings also show in some cases the development of a design, as at Queen's College (Appendix D, 15, 16) and New College (Appendix D, 24, 26). Especially interesting in this respect are the initial sketches made by Josef von Glatter-Götz for Clifton Cathedral (Appendix D, 54 a-3) with his pencilled comments. The conviction and clarity of argument on these sheets demonstrates how Glatter-Götz brought about so many individual and convincing designs such as at Freiburg, Baden, Mehrerau and Ratzeburg. The differing building philosophies of Ahrend (simple hand-craft work following historic tradition and realized at the workbench) and Rieger (whose work is realized in engineering terms on the drawing board and then carried out in the shop in accordance with the drawings), can be seen by comparing the drawings relating to the Reid Hall (Appendix D, 82) and Christ Church (Appendix D, 93-95). The drawings also indicate to some extent the care and thoughtfulness of the designer, those of Lhôte for Wallsend and Bryanston (Appendix D, 83-89 and 96-105) being models of clarity of thought and attention to detail. Some drawings, such as those for Queen's College, (Appendix D, 13), and Douai Abbey (Appendix D, 79, 80), show where the initial design failed to satisfy and where modifications were made. As far as can be ascertained nowhere today is there to be found a comparable collection of drawings relating to a specific period of organbuilding, covering the work of many builders within a particular geographical area.

Chapter IX

Some influences on the classical revival in Britain

Influences on the classical revival in Britain have been many and various: individuals, institutions, literature, recordings, and travel have all played a part. In considering these various influences the effect of private dissemination of ideas should not be overlooked, nor the overlap between the categories of persons in the areas discussed.

Most of the individuals are, or were, performers and teachers, e.g., Susi Jeans, Geraint Jones, Ralph Downes, Thurston Dart, James Dalton, Peter Williams, Francis Jackson, David Lumsden, Peter Hurford, Gillian Weir, Nicholas Danby and David Butterworth; others are organist-enthusiasts, particularly Cecil Clutton, James Long and Donald Wright. All have been influential in writing and lecturing, and most in advising. They do not form a unified whole (some, such as Downes, have worked almost in isolation), nor do they show a unified viewpoint. It is noticeable however, that, apart from Jackson, and to a lesser extent Lumsden, Hurford and Butterworth, they stand outside the traditional organ establishment, as seen in the pages of The Organ, and in bodies such as the Royal College of Organists, the Royal School of Church Music, and the Cathedral 'tradition' of McKie, Dykes-Bower and Willcocks. The lack of impetus, or even interest, within the Cathedral establishment (and it must be recalled that many Cathedral organists of the established Church are expected to act as organ advisers by virtue of their position) has been a seriously inhibiting factor in the development of classical organ building in Britain.

Bodies such as the Incorporated Association of Organists, the Federation of Master Organ Builders, the Incorporated Society of Organ Builders, and the short-lived offshoot of the latter two, the British Pipe Organ Council (founded in 1978), demonstrated a complacency summed up in the Rip van Winkle-like aim of the Federation: "To preserve and maintain the supremacy of British Organ Building throughout the world."[1] This complacency contrasts strongly with the openness and questioning demonstrated in the issues, from its inception in 1969, of ISO - Information - the journal of the International Society of Organ Builders. Also in contrast to the attitude of the Federation were the open evenings held on the completion of organs in the non-federated workshops of Grant, Degens and Bradbeer, and Peter Collins. These proved positive opportunities for exchange of ideas between builders and organists.

Slightly more positive than the generality of establishment organists and builders was the work of the Organs Advisory Committee of the Council for Places of Worship.[2] Founded in 1954, the Committee had organists, organ-enthusiasts, and builders as members, though its balance was weighted towards the 'establishment'. The Committee was not only inhibited by its membership, but also by its terms of reference which were conceived largely with regard to existing organs, and their repair and preservation.[3] If the past weighed somewhat heavily on the Organs Advisory Committee, the same could not be said of the Roman Catholic Organ Advisory Group. As indicated in Chapter VII this body, established in 1971,[4] took a more radical line, firmly espousing classical principles, alongside concern for the historic past.[5] Another body, brought about by the enthusiasm of Nicholas Thisthlethwaite, and founded in 1976, was the British Institute of Organ Studies. This society, the aim of which is the study of the organ and its music in Britain, has provided a focus for serious discussion.[6]

The influence upon the classical revival of the St. Albans Festival has been noted in earlier chapters. Also providing stimulus and forums for debate have been the University of Wales Classical Organ Summer School, (held since 1970 under the direction of Royston Havard in Oxford in alternate years to the St. Albans Festival), and the courses and conferences held at John Loosemore Centre in Buckfastleigh (which was founded in 1975 by John Wellingham). Of considerable and growing significance in education and performance terms has been the influence of the universities and public schools where, from Queen's College and Eton College onwards, a string of important instruments have been built. Noticeably absent, however, has been any comparable impetus from the music academies, other than at the Royal Northern College.

The period has also seen the appearance of a number of influential publications on the organ in English; in particular The Organ - Its Tonal Structure and Registration (Clutton and Dixon, 1950), The Organ (Sumner, 1952), The Organ in Church Design (Blanton, 1959), The British Organ (Clutton and Niland, 1963), The European Organ (Williams, 1966), Organ Building and Design (Andersen, 1969), The Organs of Würzburg Cathedral (Klais, 1970), The Organ Stoplist (Klais, 1975), Organs of Our Time (Blanchard, 1975), The Classical Organ in Britain (1975 and 1979), The Tracker Organ Revival in America (Paper, 1978), as well as the English translation of Bédos (1977). The period is neatly rounded off by Williams' New History of the Organ published in 1980. Journals such as ISO - Information (edited by Richard Rensch), and the Organ Yearbook (edited by Peter Williams), both established in 1969, and the British Institute of Organ Studies Journal, commencing in 1977, have also brought classical ideals of organ building into prominence. Though published as only a pamphlet, the two lectures on Organ Design and Construction, (given at the Royal College of Organists in 1969), in which Peter Williams trenchantly expounded his thinking, not just on organ design, but also upon its implications for the interpretation of organ music, should not be ignored. This concentration of publications, in the space of around twenty years, has radically heightened awareness of the concept of the classical organ.

Of comparable, perhaps greater, significance has been the impact of recordings and broadcasts. The recordings fall into two groups: first the early (1950's) recordings on historic German and Dutch organs by Geraint Jones, Helmut Walcha and Power Biggs, second the later (1960's), recordings on new organs in Denmark and Switzerland by Power Biggs, Karl Richter, Anton Heiller and Lionel Rogg: e.g.,

1947	onwards	Walcha	Lübeck	(DGG Archive)[7]
1950	"	Walcha	Cappel	(DGG Archive)[8]
1951	"	Jones	Steinkirchen	(HMV)[9]
1954	"	Power Biggs	Various historic organs in Europe	(Columbia)[10]
1956	"	Walcha	Alkmaar	(DGG Archive)[11]
1960	"	Power Biggs	Busch-Reisinger Museum	(CBS)[12]
1964	"	Richter	Jaegersborg	(DGG)[13]
1965	"	Heiller	Halsingborg	(Phillips)[14]
1965	"	Rogg	Grossmünster	(Oryx)[15]
1966	"	Dalton	Queens'	(Abbey)[16]
1969	"	Hurford	Sanctuaire Marie-Reine-des-Coeurs	(Abbey)[17]

To quantify the effect of such recordings, and others in the following years, is not possible but the positive reviews in The Gramophone indicate their significance. Walcha's recording of the Canonic Variations at Cappel was described as "one of the finest organ records I have ever heard",[18] and, of his recordings at Cappel and Lübeck, it was said that: "No bush is needed for the heady wine of Walcha's Bach."[19] In addition the pages of The Gramophone show the persistent re-issuing of Walcha's records. Power Biggs' Bach recording at Harvard was described as

> "one of his best discs so far.... The chief attraction of this record... has been the actual recorded sound of this wonderful organ.... Its timbres ensure a crystalline clarity for Bach's contrapuntal textures" 20

The recordings of Rogg were noted for:

> "clarity of part-playing, achieved by an organ-touch as sure in attack and release as it is sensitively directed, and by appropriate registration on an instrument offering an immense variety of organ colour." 21

As well as reviews there are also specific instances where the influence of recordings has been acknowledged e.g., in <u>Baroque Tricks</u> Downes indicates his awareness of Walcha's recordings at Cappel,[22] and for David Butterworth the hearing of Heiller's recording of the Bach-Vivaldi Concerti on the 1959 Marcussen organ in Halsingborg was a revelation and a turning point.[23] Since the 1960's there has been a continuous stream of recordings upon classical instruments, new and old.

The 1950's and 1960's also saw a remarkably formative series of broadcasts by the BBC of historic and recent classical instruments played by Downes, Jones, Jeans and Dalton. Prior to the installation of the Festival Hall organ were Downes' broadcasts from Haarlem, Alkmaar and Gouda and the Old Church, Amsterdam in 1950.[24] Following the installation of the Festival Hall instrument a series of programmes were initiated by the BBC, including:

Nov. 11, 1953	"Baroque Organs and their Music"	(Jones)
Jan. 30, 1954	"In Discussion on the Baroque Organ"	(Jones and Fisk)
May 30, 1954	"Two New Organs" Festival Hall and Fraumünster, Zürich	(Jones and Fisk)
Jan.-Feb. 1955 repeated Nov. 1956	"Early Organs in Europe" Alkmaar, Sion, Amorbach, Weingarten, Innsbruck (Silver Chapel), Ottobeuren	(Jones and Clutton)
Jan. 1959	"Some Small Organs"	
	The Harrison Experimental Organ	(Jeans and Clutton)
	Groenlo	(PietKee and Clutton)
	Jaegersborg	(Viderø and Clutton)
	University College Chapel	(Webster and Clutton)
Sept.-Oct. 1959	"Old Organs of Northern Europe" Malmö, Frederiksborg, Roskilde, Adlington, Zwolle	(Clutton and various organists)
Oct.-Nov. 1960	"Church Organs of Northern Europe" including Steinkirchen, Alkmaar, Maranathakerk (Amsterdam) and St. Andreas, Copenhagen	(Dalton)
Nov.-Dec. 1961	"Historic French Organs" La Flèche, Poitiers, St. Vincent (Paris)	
Oct.-Dec. 1962	"Organs of Spain and Portugal" Coimbra, Mafra, Gerona, Evora, Solsona, St. Vincente (Lisbon)	(Jones and Clutton)
Nov. 1964	"Historic French Organs" Marmoutier, L'Isle sur Sorgue, St. Maximin	(Clutton and various players)

There were also 'repeats' of the series of historic organs, introduced by Clutton, in 1967 and 1968. Whereas records had to be paid for, the above broadcasts brought the sounds of new and historic classical organs into the homes of English organists free! In addition to the BBC broadcasts, there were also those from Hilversum, received in Eastern England. The impetus given to the classical revival was considerable, though it is perhaps worth noting that both recordings and broadcasts tended to even out the differences between organs, a matter noted by Downes.[25] Few in England perhaps had any precise idea of the qualities of attack, tone and volume level of the differing organs.

Travel, both in the nineteenth[26] and in the present century, has had a potent influence on British organ building. The pages of The Organ record the travels to historic, and occasionally 'reformed', organs in pre-War years by Willis III, Clutton, Ellingford, Sumner and others. As the Second World War drew to a close, ex-servicemen such as John Mee[27] and Dennis Thurlow[28] came into contact with both historic and 'reformed' organs.

It was in 1949, however, that Geraint Jones "used a German engagement to study as many early German organs as possible"[29] and was recommended to visit Steinkirchen, where the Schnitger organ had been restored by von Beckerath the previous year,[30] resulting in the influential recordings and broadcasts referred to above. The following year, Downes visited Holland with Cuthbert Harrison[31] and later with staff from Harrisons and Walkers (seeing both old and new organs), in preparation for work on the Festival Hall organ.[32] Throughout the 1950's and 1960's Holland, northern Germany and Denmark were the focus for visits by builders and organists alike. The Flentrop organ at Loenen was visited by Kennard,[33] Groenlo by Niland[34] and Nicolaikerk, Utrecht by Moseley.[35] The organ of the Johanneskirk Düsseldorf and the Petrikirche, Hamburg were seen by Gallagher[36] and O'Connell[37] respectively and Walter Shewring (who had visited Holland with Downes[38]), also visited organs in northern Germany.[39] Visits to organs in Holland and north Germany were made by the Organ Club,[40] and a study tour of Dutch organs was arranged by Susi Jeans.[41] James Dalton also experienced organs in Holland, north Germany and Denmark,[42] and attention was drawn to the work of Frobenius and Marcussen by Manthorpe.[43] The writer, following a visit to southern Europe in 1968, visited Denmark and Sweden in 1969, and Switzerland and Austria in 1970. John Brennan followed to Denmark in 1970,[44] as did David Butterworth,[45] and travel to Europe has not abated in ensuing years. Other 'organ areas' were also visited to a lesser degree: Shewring drew attention to the qualities of old Italian organs[46] and, in the 1960's, David Lumsden and Peter le Huray, and Geraint Jones visited North America, encountering there not only the work of native builders but, in the case of

Lumsden and le Huray, the work of von Beckerath, and in the case of Jones, Hradetzky and other European builders.

For the organbuilders there were the International Society of Organbuilders' Congresses held in Amsterdam (1957), Strasbourg (1960), and Hamburg (1965). Following his visits to Holland with Downes, Walter Goodey travelled to Denmark in 1958 to study organbuilding there,[48] and prior to 1959 Noel Mander took his voicers to Holland for study purposes.[49] From the early 1960's the younger generation of English organbuilders began to travel widely: in 1962 Peter Walker (who had been at the Amsterdam and Strasbourg meetings), visited Holland, north Germany, Denmark and Sweden;[50] in 1964 and 1965 Peter Collins visited Rieger, and in 1968 and 1969 made visits to north Germany and Denmark.[51] Forsyth-Grant, in his forthcoming book, devotes a chapter to the influence of foreign travel. In 1956 he visited Walcker, Laukhuff and Steinmeyer. Two years later he met Helmut Walcha and heard him play the Schuke organ in Frankfurt, as well as visiting Klais. As a result of conversations with Glatter-Götz (at the 1960 ISO Congress in Strasbourg), he visited Mönchengladbach[52] - an experience which influenced the approach to the New College and other Grant, Degens and Bradbeer organs. In 1964 he took his works team on a tour of builders' workshops, as well as organs, in Holland and Germany.[53] At the 1965 ISO Congress in Hamburg he met both von Beckerath and Karl Schuke and, in 1968, on a visit to North America (when Peter Hurford was on sabbatical at Cincinatti University), he visited Casavant and met Phelps.[54] Also it should be recalled that in this period Alistair Rushworth was sent to train with Flentrop and Phelps,[55] and John Mander to von Beckerath.[56]

There was thus through travel, recordings and broadcasts a concentration of attention on the area dominated by the historic north-west European organ. Travel and communication in post-War Europe were by no means unrestricted and, as Williams has pointed out, Marshal Zhukov's checkpoints effectively shifted the direction of European (and American) organbuilding away from organs of the Silbermann school to those of the Schnitger school.[57] Steinkirchen and Cappel became dominant influences - alongside the post-War manifestations of this form in Denmark, Holland and northern Germany. The results of this bias are clearly evident in the two volumes of The Classical Organ in Britain.

It was thus possible for Herbert and John Norman to write in 1966 that:

> "A quarter of a century has produced a revolution and a revelation. Broadcasting, hi-fidelity recordings and opportunities for international travel have led to a rediscovery of the classical tone-colours and choruses of historical instruments on the European continent. It has been possible to savour the creative artistry arising from close partnership of composer, player and builder so evident in Denmark today, and to some extent also in Holland and Germany." 58

a position parallelled in words written almost a century previously (1864):

> "We well remember that, not more than thirty years since, it was the settled habit of organ builders, professors, and amateurs here to think and speak of the merits of foreign organs as a complete delusion. Not that they had any proper means of forming an opinion on the matter. They were at no pains to see and hear for themselves what the continental artists were doing at the time. They were simply content to believe that their own performances were the best in the world.... Within the last few years, however, English opinion on this subject, as on many others, has undergone a vast change. A flying speed by land and sea, cheap fares, and all manner of voyaging facilities, have sent Englishmen by shoals to the Continent.... Our organ builders, unfortunately, have not generally availed themselves of these privileges; but our organ players have, and it is interesting to watch the effect of experience as reflected in their totally changed habit of thought. From the more enthusiastic of these, indeed, it is now very common to hear the avowal that an organ-hunting expedition on the continent has satisfied them that there is not an English organ worth playing on! Now, allowing for the dazzle of novelty and some trifle of exaggeration, there must be a little truth in all this." 59

Chapter X

Some aspects of the organ repertory and performance style in Britain

The early part of the century was, as Downes has suggested, dominated by a "virtuosity and musical involvement potentially quite equal to today's standards."[1] It was a time when Cunningham, Lemare and Pyne held sway in the tradition of W. T. Best. Repertoire and taste were, however, another matter. The staple diet consisted largely of some Bach, Mendelssohn, Rheinberger, Lemmens, Widor, Dubois, Guilmant and Saint-Saëns, together with works by Wesley, Smart, Stanford, Parry, Wolstenholme and Hollins; relatively little pre-Bach, Franck or Reger was performed.[2] Transcriptions were still an important part of the repertoire: indeed, when Thalben-Ball took the FRCO examination in 1915, the set works were Prelude and Fugue in C by Bach, Franck's Third Choral and Best's arrangement of the Larghetto from Beethoven's Second Symphony,[3] and as late as January 1930 Walter Emery performed the "Allegro con graziozo" (5/4) movement from Tchaikovsky's Pathetique Symphony as a part of his Fellowship examination.[4]

In the 1920's Dupré "took London by storm," not just by his virtuosity but also by his "classical" performances of Bach's fugues on "exposed" mixtures at Westminster Cathedral.[5] He also gave performances of the French romantic school, and of some works of the earlier French school. As noted in Chapter I, 'classical' performances were also given by Guy Weitz of Bach and other early masters. Thus, as the years moved on towards the second World War the standard repertoire of the English organist was some Bach, the late romantic works of Franck, Saint-Saëns, Guilmant, Dubois, Widor and Vierne, Rheinberger, Reger and Karg-Elert, and the English school typified by Smart, Stanford, Parry, Harwood and Whitlock but as mentioned above, and in Chapter IV, there were exceptions such as Weitz and Jeans - though both were 'foreigners'.

At the opening of the second half of the century the differing approaches to repertoire may be exemplified by two programmes, both from 1950, given by David Willcocks and Susi Jeans[6] respectively:

David Willcocks at Salisbury Cathedral

Toccata, Adagio and Fugue	J. S. Bach
Prelude on a Theme of Tallis	H. Darke
Choral in E	C. Franck
Largo (New World Symphony)	A. Dvorak
Fantasia and Fugue in G	H. Parry
Passacaglia and Fugue	J. S. Bach
Symphony from "Solomon"	G. F. Handel
Fantasia in F major and minor	W. A. Mozart
Rhosymedre	R. Vaughan Williams
Prelude and Fugue in G Minor	M. Dupré

Susi Jeans at All Saints, Leatherhead

Gloria tibi trinitas	Blitheman
Ricercare	Bull
Toccata	J. P. Sweelinck
Es ist das Heil	J. G. Walther
Noël	C. Daquin
Trio VI in G	J. S. Bach
Passacaglia and Fugue	J. S. Bach

With the building of the Festival Hall organ 'new' areas of the organ repertoire and registration were highlighted: "Now, as never before, the ordinary music lover is hearing the superb chorale preludes and trio sonatas of Bach, and much other music long denied him."[7] This vast organ-literature machine, whilst maintaining an emphasis on Bach, thus brought to a wide public the works of Scheidt, Sweelinck, Lübeck, Bruhns, Buxtehude, Couperin, de Grigny, Marchand, Clérambault, as well as the romantic repertoire of Franck and Reubke, more 'modern' works by Reger, Hindemith, Schmidt, Walcha, Dupré, Langlais, Alain and Messiaen. The programmes of Walcha, Richardson, Thalben-Ball, Marchal in January and February of 1955 exemplify this:

Helmut Walcha - 19 January

Lübeck	Prelude and Fugue in E
Johann Pachelbel	Chorale Preludes:
	Vom Himmel hoch, da komm ich her
	Wie Schön leuchtet der Morgenstern
	O Lamm Gottes, unschuldig
	Ciacona in F minor
Buxtehude	Prelude and Fugue in F
Bach	Toccata, Adagio and Fugue in C
	Trio on 'Allein Gott in der Höh' sei Ehr''
	Prelude and Fugue in G

Arnold Richardson - 26 January

Bach	Allabreve in D
	Choral Preludes:
	Herzlich tut mich verlangen
	Wo soll ich fliehen hin
	Toccata in F
Mozart	Fantasia in F minor and major, K.594
Mendelssohn	Sonata No. 2 in C minor
Messiaen	Les anges
	Desseins éternels
Dupré	Three preludes and Fugues:
	B major; F minor; G minor

George Thalben-Ball - 2 February

Handel	Overture, Ariodante
Festing	Air and Two Variations
Liszt	Fantasia and Fugue on 'Ad nos, ad salutarem undam'
Balbastre	A la venue de Noel
Garth Edmundson	Impressions Gothiques
	Passacaglia
	Silence mystique
	Toccata (Gargoyles)
Karg-Elert	Chorale Improvisation on 'Nun danket alle Gott'

André Marchal - 9 February

Clérambault	Caprice sur les grands jeux
Couperin	Dialogue sur la voix humaine
Daquin	Noël
Bach	Fantasia in G
Cesar Franck	Pièce Héroique
Jehan Alain	Trois Pièces
	Variations sur un thème de Jannequin
	Le jardin suspendu
	Litanies
Liszt	Fantasia and Fugue on BACH

The Festival Hall organ recitals also brought the organist out of the organ-loft (and the Cathedral's generous acoustic conditions), into contact with the public and more subject (and responsive) to musical criticism, which in turn heightened awareness of performance standards.

It is also important to note, alongside the Festival Hall recitals, the burgeoning, in the late 1950's of the 'early music' bubble, demonstrated by performances such as those of the Schola Cantorum of Basel (readily available also on record), of Karl Haas and the London Baroque Ensemble, Michael Howard and the Renaissance Singers, Thurston Dart with the Philomusica of London and Denis Stevens and the Academica

Monteverdiana - though 'authentic' performance was not new to England. As Williams has indicated, Salaman, Engel and Hipkin were playing harpsichords in public before the end of the nineteenth century;[8] Frederick Bridge attempted an 'original' performance of "Messiah" in 1889;[9] and there were also the activities of Dolmetsch and his circle.[10]

Although in the immediate post-Festival Hall years there were published a number of volumes of 'early' organ music, such as the Peters <u>Tallis to Wesley</u> series and the inexpensive editions, also by Peters, of works by Buxtehude, Frescobaldi, Scheidt, Telemann, Boehm, Sweelinck and Titelouze,[11] the thinking of most English organists did not initially go much beyond the thinning of textures in Bach, and the use of the new 'Positiv' divisions. Just as the Royal College of Organist's organ belatedly followed the trend set by the Festival Hall organ, so, gradually, the performance of arrangements (such as that of a Walond Voluntary by Harry Wall, to be found in the examination syllabus of 1954), ceased to be required and, within a very 'traditional' syllabus, works by earlier composers such as Lübeck and Buxtehude began to appear; even so, it was some time before works from the classical French school found a place in the syllabus. As the pages of the <u>Organists Review</u> in the 1950's and 1960's show, English organ playing remained dominated by the needs (real or imaginary), of accompanying the Anglican service, and by the late-romantic, post-Vierne French school of Messiaen, Dupré, Langlais, Alain and Duruflé. This late-romantic organ tradition was personified in England by the limpid music of Howells whose style owed much to the French impressionist tradition of Debussy, Ravel, Vierne and Dupré, (as well as by his similarly influenced English contemporaries Holst and Vaughan Williams).[12] Whereas at Notre Dame, St. Clotilde and St. Sulpice the organ retained its musical place in the liturgy, with vividly coloured, improvisatory, 'alternatim' movements at Mass and Vespers, in the Anglican service solo organ music was restricted to in-coming and out-going voluntaries. In Howells' hands the French-impressionist style became a mild pre-Matins or -Evensong crescendo and diminuendo, not without its own beauty, but of limited significance.

The 1970's, however, saw further change, again mirrored in the pages of the Organists' Review, which was dominated by the writings of the Oxford and Cambridge generation of Dalton, Lumsden, le Huray and Higginbottom, and by the writings of Williams in The Musical Times. No longer was 'style' seen as just having the right-pitched stops with the 'right names'; the advent of the organs at Queen's and Clare, and the performances of Walcha, Jones, Power Biggs and Rogg had changed all of that. Mechanical action now exposed the technical deficiences of players when performing Bach, Buxtehude and Couperin. As was noted by Cambridge organ scholars in master classes at Clare in 1971;

> "The thing which Rogg was most struck with was the fact that most of us needed basic technical expertise." 13

Glyn Jenkins, who was one of those taking part in the master classes, wrote later in similar vein:

> "The situation is now this: a large number of fine instruments have appeared in churches and concert halls.... their responsive mechanical actions and refined voicing offering the most exciting possibilities for a complete re-appraisal of organ technique. Yet few have so far taken advantage of the opportunity. Indeed, much of the antagonism which these 'new' instruments have encountered, arises directly from the fact that we simply do not know how to play them properly." 14

These changes in emphasis, in repertoire and registration practice, coupled with the wider experience of organs, both in England and abroad, steadily brought matters of playing technique to the fore. For most of the century British organists had been brought up on the tutors of Stainer (C.1877),[15] Buck (1912),[16] and Alcock (C.1913).[17] In the 1950's Flor Peeter's Ars Organi[18] became available in England and was used by both Downes and Danby. The basis of Ars Organi was the Lemmens school, somewhat pianistic, but also said to derive from the 'Bach tradition', via Hesse of Breslau.[19] It did, however, discuss matters of articulation and phrasing and 'rules', not dissimilar to those of Dupré,[20] were given for various musical contexts. At the same time Ars Organi gave a false perspective in its neo-baroque suggestions for registration and in that it did not distinguish between 'original' and suggested practice, e.g., a Fond d'Orgue by Marchand is registered as a Plein Jeu, and the distribution of voice parts in works by Titelouze is completely re-arranged![21] Germani's Methodo per Organo,[22] with its emphasis on pedal technique, also reached Britain in the early 1950's, as did the heavily-fingured editions of Bach, Franck and Liszt by Dupré.[23]

The next decade saw the publication of Viderø's Orgelschule (1963),[24] the aim of which was "to give the student the necessary technique for playing the classic organ music."[25] Its basis lay in that of the nineteenth-century French organ school "modified by modern piano playing."[26] Unlike Ars Organi it ignored matters of style and registration. In 1971 was published C. H. Trevor's Oxford Organ Method: this, in relation to registration at least, was a demonstration of the final Chapter of Niland's Introduction to the Organ, "Making the best of the Average British Organ",[27] applied to snippets of the organ repertoire, rather than an essay in specific style consciousness.

All of these tutors, from Stainer to Viderø and Trevor, demonstrate a pianistic approach. In Flor Peeter's words: "The pupil commencing the study of the organ should have previously acquired a sound and well developed piano technique."[28] In similar vein "the Dupré edition of Bach is completely fingered and footed in the same [pianistic] style as his own music."[29] No tutor or method has yet been published which gives due regard to the organ as being "first of all a wind instrument,"[30] though Jenkins did draw attention to the idea that, "if we take it upon ourselves to impose.... the strongest demands on our organbuilders, we must be prepared to modify and restore the art of organ playing accordingly."[31] One early example of a more stylistic approach was noted by Clutton who drew attention to the playing of Susi Jeans, and to her reliance "upon accent, phrasing and clean fingering" in contrast to others who were "smudging about with rolling diapasons, wildly flapping swell shutters, and creeping technique,"[32] and from Schweitzer (1911) and Dolmetsch (1916) onwards there had been a growing change of attitude in general terms towards the phrasing and articulation of 'early music'. The idea that the organ, and its music, might demand a 'different' technique, was also given expression in a series of articles by le Huray, (entitled *On Playing the Organ*) in *Organists' Review*.[33] These articles revealed a radical change of stance, one which no longer accepted that, "on modern organs.... the hand technique required is not in any way different from that of the piano."[34]

This general change in musical attitude is demonstrated in the second half of the century by a number of influential publications: particularly *The Interpretation of Music* by Thurston Dart, published in the year of the opening of the Festival Hall organ. In the following decade were published Donington's volume, *The Interpretation of Early Music* (1963), which was dedicated to the memory of Dolmetsch; *An Amateur at the Keyboard* by Peter Yates (1965), which also followed in the footsteps of Dolmetsch, and in 1965 and 1966 respectively were published Hermann Keller's *Phrasing and Articulation*, and *The Organ Works of Bach*.

It might have been expected that the period would have seen some development in the composition of organ music for the new classical organs. As yet, however, other than a few isolated items such as Hurford's *Five Short Chorale Preludes* (OUP 1958), most organ music by English composers such as Leighton or Berkeley remains largely within the earlier 20th Century French-English impressionistic tradition. In view of our lack of a chorale, or liturgically, based organ tradition, coupled with the quality of the early repertoire, this is perhaps not entirely surprising. It is also the case that most of the new generation of players have received little, or very conservative, teaching as composers. Whether or not the combination of new liturgical demand, coupled with the presence of classical instruments, will stimulate composition, remains a matter for conjecture.

The musical changes that have occurred in connection with the classical revival may thus be seen as changes in attitude, towards both the organ and its music. Just as the Jacobikirche organ had stood and played for several centuries unnoticed, and at times undusted, so the classical organ repertoire had (largely) always been there. The work of Schweitzer, Guilmant, Straube and Dolmetsch had lifted the curtain in places; the Festival Hall organ resoundingly blew the dust and debris off the music and, the consequent over-articulated style adopted by performers allowed an X-ray or skeletal, performance of the literature; but it was on organs such as Queen's, Eton and Trinity that it was again given breath. The classical organs following Queen's are thus further steps towards expression of the music, they are not an end in themselves, but have been built so that the "music be played right."[35] In this sense they are a continuing assertion of the principle proposed by Gurlitt that:

> "Each and every kind of music possesses its own particular sound: that every style of composition is intimately connected with a certain tone quality, which can be reproduced only by means of the instruments for which it was written." [36]

and played, it might be added, in the way the composer might have expected. As such the classical organ may be seen as "basically an early music instrument"[37] the implication for technique is that just as the eclectic-organ fashion fades, so must an eclectic technique, based on nineteenth-century pianism, give way to a technique rooted in the nature of the classical organ, a wind instrument played by a keyboard, and its repertoire.

PART FIVE

Chapter XI

Philosophies and Trends

At a time when technology, the throw-away society and the pseudo-organ have seemed to threaten both music and the organ, it might be thought remarkable that there has been a revival of classical organ building. After all, organs are expensive, no-one has to have them,[1] and when well built they last for centuries. A cogent reason for both their survival and revival has, however, been put by Andersen:

> "In the last analysis, the old-fashioned musical instruments are a pleasure because they are not lifeless in our hands. They have their own laws, and they can be obstinate, but they reward us with something beyond our own efforts or even our own capabilities." 2

It may thus be suggested that it is the musical nature of the classical organ, its capacity to respond to and transmit the musical intent of the player, that is at the heart of the classical revival.

The factors necessary to make an organ a "genuine and living musical instrument, in the same sense that an oboe, a violin, harpsichord or whatever instrument can be said to be truly musical,"[3] have been discussed in general in Chapter I and in detail in ensuing chapters. It is, however, perhaps worth requoting, in this context, Peter Williams' definition of the organ:

> "A collection of pipes, blown by wind pressurized at a natural level, sounding when the player's finger directly admits that wind and physically contained in a resonating box placed according to acoustical considerations in its building." 4

Within the definition there may be differences of style, not to mention taste, craftsmanship and artistry, but these may not be such as to deny it its historic relationship - it is in principle an historic creation[5] - nor its internal cohesion. Fidelity, then, to the definition - and to the literature of the organ - are hallmarks of the classical revival.

Maintaining both the historical relationship and internal coherence demands not only that the organ has a characteristic form and homogeneity, but in turn precludes a shopping-list, or eclectic, approach to design.

It might, however, be thought that the precision of the definition and the demands of so cohesive an approach will result in an undesirable uniformity. Indeed the classical French organ, or the work of a builder such as Cavaillé-Coll suggests that "uniformity may be a malady of the species."[6] Also, it is only through the repetition of ideas that the work of a builder, or school of builders, is refined and brought nearer the 'ideal'.[7] Only from this repetition can a style be identified. Does uniformity then endanger the species, perhaps as much as might divergence from the definition?

This dilemma, of, on the one hand, uniformity and, on the other, incoherence, can be resolved if every organ (other than small positives) is designed for its surroundings. Unlike, for example, the oboe, harpsichord and violin the organ is a fixture in its surroundings. Every location and acoustic is different and the organ builder has the task of solving each assignment so that there is harmony of ear, touch and eye in every instance.

There is also the ever-present tension between the historic nature of the organ and its re-creation today. Between on the one hand Williams' dictum that, "in the past lies the future of the organ"[8] and on the other that of Klais: "I build organs which are not copies, not imitations,"[9] organs which represent 'convincingly' all the significant areas of the organ repertory. Klais also makes the point that 'convincingly' means "the interpretation of a work not exclusively from the historical point of view."[10]

This tension, coupled with the diversity of circumstances, leaving aside the personal characteristics of each builder, should preclude uniformity, whilst the format, mechanical action, encasement, 'musical' winding, and the Werkprinzip (accepted by builders as diverse as, for example, Andersen, Ahrend, Glatter-Götz, Metzler and Klais) provides consistency. The classical revival is thus not concerned with a search for the ideal organ but for organs which are ideal.

Since the classical format is consistent and as the "basic engineering problems of the tracker organ have already been solved,"[11] then the criteria for solving each assignment may be seen in terms of function and literature and the various balances between them. In the past builders had relatively circumscribed aims, their organs were designed for one kind of music, and the liturgy they catered for was specific.[12] Today we have a wider historical and cultural perspective. The result of this is that the extant literature is seen as the guide for organ design,[13] and the view is proposed that the organ can only be "fully understood in relation to its literature."[14] It is thus clear that organs in the future will be as much a response to aesthetic choice as to function and, even when the function is clearly determined by matters such as 'ecclesiastical' demand, there will always be areas of aesthetic choice.

What then are the functions of the organ today? These are the performance of music within the liturgy and the presentation of the organ repertoire. It might be suggested, in passing, that there need be no conflict in principle between these two areas. Within the churches the moves towards simplicity in liturgy are evident, as are the moves towards the centrality of eucharistic celebration. This liturgy has now a clear emphasis on dialogue between ministers and community. The ministers may vary from one, or more, celebrants with or without choir or cantor. The choir may also be seen from two angles, either as an extension of the 'ministry' or as a part of the congregation. The classical organ with its Werkprinzip format may, in this context, be seen as mirroring both the "noble simplicity"[15] of the new liturgies and the various vocal groupings. Such a role places certain constraints upon the organ: it must be placed so that all who sing may be satisfactorily accompanied, the foundation stops must be soft enough to accompany a solo voice, there must be sufficient variety for choir accompaniment and sufficient power to accompany a full congregation. None of this, however, implies any particular school or style of organ building. The accompaniment of these terraced, 'alternatim', dynamics is no problem for the classical organ; indeed it might be argued that this is its historic origin and role. When, however, the choir has a role which involves the singing of relatively complex accompanied music (such as the late nineteenth- or twentieth-century Anglican canticle settings), then the classical balances may be disturbed.

It is in this context that the question of the 'Swell' organ so often arises. In most instances, however, the accompaniment of the congregation is paramount, and will remain so. This being so, there remain wide areas in which 'taste' must be exercised - any style of plenum can accompany a congregation. As for the performance of solo organ repertoire in churches, again any choice of style is a matter of taste rather than necessity. Thus a variety of tensions and priorities are likely to remain where organs for churches are concerned, though the employment of the classical format appears largely assured. Whilst as yet no one 'style' has emerged, some interesting responses to the balance of liturgical dialogue can be seen in recent organs at Walsingham, Petersfield and Collier Row by Schumacher (Appendix A, 86).

Priorities may, however, be different in schools, colleges and Universities - with or without chapels. Here, it may be argued that the education of young musicians is a priority. Above all the first need is for a sensitive key action, and secondly comes the opportunity for differing registration practice so that the various aspects of the repertoire may be illuminated. In practice approaches have differed: for example, at Huddersfield Polytechnic, the Royal Northern College of Music and St. Andrew's, relatively eclectic stop lists have been adopted. At Queen's College, Eton, Southampton, Reid Hall and Pembroke College a deliberately selective approach is evident, though only in the Reid Hall, Edinburgh was the matter of key-action quality seen as a first priority,[16] followed by specific stylistic choice. It should again also be noted that as yet the London music colleges have not attempted any solution, other than on the smallest scale[17] to the provision of organs for the musical education of organists.

The influence of the 'early music movement', coupled with the growth of a more general stylistic awareness amongst organists - resulting in part from organs such as at Queen's, Eton, Trinity, Pembroke, Southampton and Edinburgh - thus seems likely to result in the growth of more specifically oriented historical style organs in the future. Such a trend is very evident in North America where a number of instruments with specific stylistic leanings have already been built: e.g. in seventeenth century 'Dutch style' at Oberlin (Flentrop, 1974),[18] French style at McGill (Wolff, 1981),[19] and in the style of Fritsche and

Stellwagen at Oberlin (Brombaugh 1981)[20] and Wellesley (Fisk, 1981).[21] The trend in England, following Trinity and Pembroke, appears similar, with future seventeenth- and eighteenth-century style organs planned for the University Church, Oxford by Metzler and the University Music School Concert Room at Cambridge by Collins/Edskes. England seems, however, still some way from the point where an organ will be built to illuminate the works of earlier English composers such as Byrd, quite apart from the lesser native composers of the seventeenth and eighteenth century.

A more 'eclectic' approach is maintained in the 1982, St. David's Concert Hall organ designed by Downes and built by Collins.[22] This organ follows the pattern set at the Royal Festival Hall which aims to accompany massed singing, match the orchestra in Saint-Saëns, provide for continuo playing and perform the early and romantic organ repertoire.[23] Such overtly eclectic organs will probably be the exception in future and, just as there has been a development from the Festival Hall neo-classical, unencased, electropneumatic organ to the classical encased, mechanical-action organ in the St. David's Hall, there will doubtless be a further continuing trend towards a yet more stylistic or selective approach.

It is perhaps apposite at this point to discuss the matter of style copies. Views vary about these: for some, such as Phelps,[24] Glatter-Götz[25] and Shäfer[26] their builders are seen as opting out of the responsibility to contribute towards progress and, by "re-scaping"[27] former styles, escaping from the challenge to build today. Such builders are said to be "enchanted by the idea of never having to take an initiative."[28] Williams, however, proposes that

> "the more strong-willed and knowledgeable a builder is, the more exactly he will have an historical type in mind: and the more uncompromising in this respect his organ is, the more likely it is to be able to achieve simple and natural beauty of tone, given a basic technical skill." 29

No matter how careful the copy - leaving aside the problem of what to copy - organ building, as Williams, Shäfer, Phelps and Glatter-Götz all imply, is dependent upon the skill, knowledge and personality of the individual builder. It is noteworthy that when builders such as Ahrend and Metzler (whose restorations at Bremen,[30] Stade,[31] and Innsbruck;[32] and Sitzberg[33] and Muri[34] may be considered distinguished) build new organs, as at Edinburgh and Frauenfeld, though these are very much in the spirit of the old they nevertheless carry a strong personal stamp. There is also the point made by Flentrop that:

> "If one doesn't dare to design a good new organ, then rather copy one of our magnificent old organs. That is almost always to be preferred to a copied bad modern organ." 35

But it is still important to note that the conscientious copying of an historic model will not produce a work of art per se.[36] The study and restoration of old organs in their original acoustic surroundings may therefore be of much significance for the future of organ building, more so than the making of copies such as that by Reil in Scheveningen[37] - indeed such 'copies' are rare. Where, however, the study and restoration, and even copying, leads to the building of instruments such as Frauenfeld, an organ

> "based upon a classical conception: unity of sound and aesthetics as well as unity of optical and aural proportion," 38

but with its own clear character, then as a learning process it may surely be commended. Also if a significant old organ is in a parlous, perhaps rotted, condition, such that performance upon it and restoration are impossible, then the value of a careful copy can hardly be denied, as has been shown by the achievements of harpsichord makers in recent years.

For England such an approach poses certain problems: virtually no historic organs survive in a remotely intact state - and research into the historic English organ has barely begun. Nor is the musical repertoire of comparable significance to that of the seventeenth-century mainland European heritage - except for the keyboard works of Byrd, and for these a relatively modest organ suffices. Furthermore, even the finest of the historic English builders, such as Smith and Harris, can be seen as no more than secondclass artists.[39]

Severe style reliance is not, however, the only approach propounded: an alternative position is adopted by Phelps,[40] and Fesperman.[41] In this, the north west European organ and the polyphonic music of Bach are recognised as pre-eminent - and thus as the starting point. Alongside this is put the more colouristic French classical tradition. Phelps makes the point that:

> "German music suffers less played on stops scaled more towards the flutiness of the French than does the French music when played on narrow German-type stops." 42

As for the Italian and English schools of composition these he considers, "can be accommodated more than adequately on organs oriented towards the French and German traditions."[43] As an exemplar of this approach the organ in Our Lady of Sorrows, Toronto, is not without significance. In this context it is worth recalling that Bach himself favoured a 'French style' approach when concerned with the rebuilding at Mühlhausen, (1708)[44] as did Silbermann in 1710 at Freiberg Cathedral.[45] Also, as Janke has suggested, "the full voicing of Gottfried Silbermann, as can be heard in the cathedral organ in Freiberg in Saxony and in other places, has always been praised."[46] Possibly what is now needed in England is a builder who will

> "dominate the scene as Gottfried Silbermann dominated Saxony in Bach's time by deliberately turning his back on local-national techniques and introducing the best of other organ types that he had got to know elsewhere." 47

Though the principal areas of debate and choice in organ building are aesthetic ones, nevertheless, the solution to aesthetic problems is, as Lhôte has stated, "very often of a technical nature."[48] It is also the case that, as Williams has propounded,[49] that the wider the experience of the musician or builder, which, in a sense, increases the possibilities of choice, the narrower the margins actually become. If one examines this from the tonal standpoint then, in Flentrop's words: "Each type of organ has the kind of construction serving the reeds it has."[50] For example, if French reeds are proposed, then the pallets will be placed at the front of the chest and the reeds at the rear. The logical consequence of this choice is for the organ to have suspended action. If, however, German or Dutch reeds are employed, which are normally placed over the pallets, then the pallets must be at the back of the chest and the action movement will be via squares (or backfalls). All of this in turn stems from the practical need for the reeds to be at the rear of the main chest for ease of tuning. Similarly, if a Schnitger-style Principal is used then there are implications for the style of flutes employed - i.e., the wind pressure required by the Schnitger style would rule out the more lightly blown, wide-scale, Italian Flauto.

Acoustic, too plays its part in making tonal demands. There is little point in placing French-style mutations or reeds in a small, 'dry' room:

> "The Tierce en taille, Basse de Cromorne, Dessus de Voix Humaine seem actually to require a large stone building. The wafting of quiet flute accompaniments pierced by the melodies of piquant mutation or reed stops.... must be one of the major factors in French organ music." 51

As for key action, just as the type of reed, or principal chosen, so the choice of action-run, tail- or centre-pivoted, squares or backfall, has its consequences. The growing trend in the use of suspended action, demanded by musicians because of its " 'elegant', 'subtle', and 'responsive' " qualities, makes this point clear. At its best it has few pivot points and no interruption, other than the roller-board, from key to pallet - it is the simple action for the 'simple' organ. It does, however, restrict the disposition of other divisions, and has implications for the stoplist. Any modification of its essential simplicity, e.g., 'floating' the action or building wind-chests, rollerboards and key-frames in one unit to take account of heating conditions,[52] diminishes its advantages and makes the use of squares or a centre-pivoted action preferable. Here, growing technical understanding may make for a more informed choice in the future, than just the wish for 'mechanical action'.

What of stop action? In small to moderate sized organs the matter hardly arises: mechanical action is the choice. But, as history indicates, from the sixteenth century onwards the pressure for pre-arranged register control on large one-manual, and larger two- or three-manual organs, is unlikely to go away. The unreliability (and technologically complex nature) of electrical stop and combination action - the very technology of which removes it from the control of the organ builder - suggest still greater use of mechanical stop-action. Then,at least, the action will always work. Large-scale mechanical combination action is both unwieldy and expensive and is thus unlikely to gain much ground, though a very simple 'Lombardic', free-combination has recently been used very successfully by Tamburini at Christ the King Roman Catholic Church, Coventry. In this the stop-levers pull forward and engage a block which enables the stops so pulled to be moved by mechanical foot pedal. The stop levers may still be used normally when placed in the 'pulled-out' position. On larger organs, e.g., Christ Church, it may be that secondary electrical devices will be applied to mechanical stop-actions in the future for the more elaborate literature of the nineteenth and present centuries. As, however, organ building becomes more and more craft-based, then the 'philosophical' stance of the organ builder is more likely to be opposed to other than a simple mechanical stop-action.

Wind supply is likely to remain a matter for discussion. As Fisk has pointed out this remains the "least understood" part of the organ,[53] despite its being the "Organ's Breath of Life." Here again, stemming from Flentrop's restoration at Evora (where the old style winding was retained) and Metzler's organ at Frauenfeld with its "flexible wind supply",[54] movement away from in-built regulators to more 'historic' types of winding is evident. In instances such as the Reid Hall organ, which is specifically style-oriented, this poses few problems. Where, however, greater versatility in relation to repertoire is demanded, then the differing wind demands of various styles suggests the need for devices which will give 'stable' wind for Widor and Messiaen, and 'breathing' wind for music up to around the time of Franck.[55] Such devices have been used for example by Flentrop at Duke Hall in North America.[56] The control of the wind regulation is then simply at the pull of a draw-stop. The inbuilt regulator might well be improved in future and will probably continue to be used in circumstances where there is not sufficient space for a more 'breathing' wind supply.

With regard to scaling and voicing, no one school or style has yet emerged, but the general interest in the work of earlier masters is likely to continue to add to the stimulus given by the newer classical builders. Now that the principles of classical organ design have been re-established, the shift towards a less aggressively 'classical' or 'neo-baroque' stance will, it is to be hoped, produce even more 'musical' organs. Voicing still remains a matter of experience and intuition and will finally be a response to the particular circumstances. As yet no individual voicer of outstanding stature has emerged in England. Voicing, however, is of critical importance. As stated by Erik Frobenius; "It is the painting for which all other aspects of the organ are the frame."[57]

Though many dismal case designs are to be found in the pages of the Classical Organ in Britain there appears to be a growing improvement in case architecture, the better examples reflecting the overall trend towards the historic, following Queen's, Haverfordwest, St. Hugh's, University College School and others. The interest in the historic English organ seems likely to produce cases deriving from those of Dallam, Smith and Harris. Already two Dallam/Harris style designs are in train for Sherborne School and St. Gregory's Roman Catholic Church, Cheltenham, while the Collins/Edskes organ for Cambridge may well have an Alsatian-Silbermann-style case.[58]

Again style copy is not the only way forward and principles enunciated by Glatter-Götz,[59] and demonstrated at Mönchengladbach,[60] provide an alternative possibility. His viewpoint is based on the fact that an organ case is a piece of furniture usually with six sides. Though the base is invisible, as is largely the top, nevertheless four sides remain. The case is thus a three-dimensional object - a sculpture - an object seen not just from the front. This view of the organ as a sculpture is not always heeded and as Glatter-Götz said, and the pages of the Classical Organ in Britain show, most builders "design an organ case as if it were two-dimensional, a picture."[61]

The debate as to the placing of contemporary styles in old buildings and old styles in new buildings will doubtless continue - though no one has yet complained of placing a harpsichord in a new building!

The debate, however, is particularly marked with regard to decoration and there would seem no twentieth-century equivalent to the mouldings and carvings of the seventeenth and eighteenth centuries (the shapes of which, Flentrop suggests, benefit the tone).[62] Also, with the rapid transmission of ideas, any new style can appear passé with alarming rapidity, the 'contemporary' case becoming out of date before it is even built. To quote Glatter-Götz again: "Our time has no spirit and hence no style. What is worse: every effort to design to what spirit one has, is seen around the globe within a week."[63] Whether the future will bring 'new' forms of case design, as at Clifton Cathedral or as in the work of Frobenius and Marcussen, remains a matter for conjecture, though the basic 'Gothic' or 'Italianate' case forms, and forms arising from the planting of pipes in thirds for good blend used by these builders, still allow for both variety and consistency.

The trend towards simpler, more style-conscious, dispositions is evident in the stoplists - as also in other areas of recent organs. There still remains in England, due to the wide demands made by some organists, a requirement, to greater or lesser degree, for a 'versatile' organ. This results from several factors including the post-Festival Hall neo-classical, eclectic concept, but also due to growing experience of the music of the various organ schools brought to the fore by that organ, and of course to 'ecclesiastical demand'. Nowhere is this more evident than in the matter of the swell organ - i.e., a substantial romantic division, and the question remains as to whether such a division can have a musical relationship to a classical Werkprinzip scheme. Many English organists feel, as did Schweitzer, that "the swell belongs to the nature of the organ as four feet belong to a horse,"[64] and Andersen makes the point that the majority of Europeans prefer a swell organ;[65] in relation to Jaegersborg, he suggests that closing the Brystvaerk doors,

> "creates particularly fine echo effects and a very suitable regulation of the intensity when the Brystvaerk must be used for accompanying soloists. Pedantic ideas carry no great weight in opposition to these advantages." [66]

In a modest-sized organ such as Jaegersborg, where a Brustwerk is often possible, there is, however, no place for a swell organ of substantial dimension. Leaving aside the Brustwerk and Oberwerk positions for a swell, the placing of a large swell organ division within a main case has several effects; in particular the prospect often becomes rectangular, the case depth is increased by an undesirable amount and, action apart, the sound can lack liveliness. Similarly, placing a swell division behind a main case poses obvious problems. To some extent it might be supposed that the provision of a swell is a matter of scale. Where large organs are concerned, and this really means those with a 16' or 32' prospect, then it is possible to conceive a swell organ within a Werkprinzip context. Such divisions can be found in the Marcussen organ at Linz,[67] where the swell is an Oberwerk, or in the organs by Klais in Würzburg Cathedral[68] where the swell is placed beind a large clock face in the centre of the prospect! or, as at Oberursel,[69] where it is behind the long feet of the 16' Pedal prospect pipes.

Questions of musical style still remain however: the late-romantic English and French swell organs spoke into the main case and, as the swell opened, modified the sound of the Great. Such an effect is implicit in certain music of the nineteenth and twentieth century. Here the clash between the 'division principle' and the 'increase-decrease principle' is at its most acute. In relatively smaller classical organs there is not only the problem of locating a swell organ (and its attendant basses), but also of determining its role in the literature as well as its relationship to principals and flutes. It has to be said that up to the present, none of the solutions yet adopted within a Werkprinzip format in England has totally satisfied the needs of the romantic repertoire or the 'increase/decrease principle', and respected the classical balances. Perhaps a future need will be the provision of Cavaillé-Coll-style organs?

Two other areas of disposition might be noted: one is the provision of organs, particularly in response to the demands of the Roman liturgy, for an organ with a full chorus for congregational accompaniment and a second, 'continuo' manual, as at Walsingham, of just one stop, to accompany a cantor or small group of singers. The other, in a way opposing tendency, is for Roman Catholic churches to be satisfied with a one-manual organ, sometimes of generous proportion (e.g., Walker, Leeds, 1983), in contrast to the Anglican Church where a two-manual organ is so often felt to be de rigueur.[70] This is a circumstance similar to that in the time of Schnitger where Lutheran organists "preferred, wherever possible, an organ with two manuals"[71] as against Catholic organists who had many more one-manual organs.

In arriving at solutions to organ design the role of organ builders, advisers and architects should be noted. The craftsman organ builder, with his personal approach and style, must be given rein to develop and not be 'led by the nose' or have his work dictated by organ consultants or architects, though musicians clearly have the responsibility of placing the demands of literature and function of the organ before the builder. Similarly, the adviser must bring the needs of his client clearly before the builder and acquaint his client with the possible styles of building appropriate, in principle, to the client's needs. As for architects, the damage done to the organ revival (and organ architecture) by the 'functional' Festival Hall image will take many more years to repair. However, as understanding of the nature of the organ grows among architects, we may hope for development of co-operation such as has been seen in Denmark, resulting in the further growth of a local or individual builder style.

To sum up, the classical format provides possibilities, not solutions, for the building of fine organs, organs which are more than the sum of their parts, organs which "charm the ear as they must animate the spirit and ravish the eye."[72]

To ignore the format is "to compromise the identity of the instrument,"[73] it provides a means of focussing the mind of the builder and it makes highly specific demands. As Stravinsky wrote:

> "The more constraints one imposes, the more one frees oneself of the shackles that chain the spirit." 74

For the future then,

> "We need to apply our own minds and our own ears to the task of discovering what makes organ music come alive under the player's fingers." 75